

9th Biennial Noxious Weeds Conference

IMPROVING WEED MANAGEMENT
FOR THE 21ST CENTURY

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DUBBO**

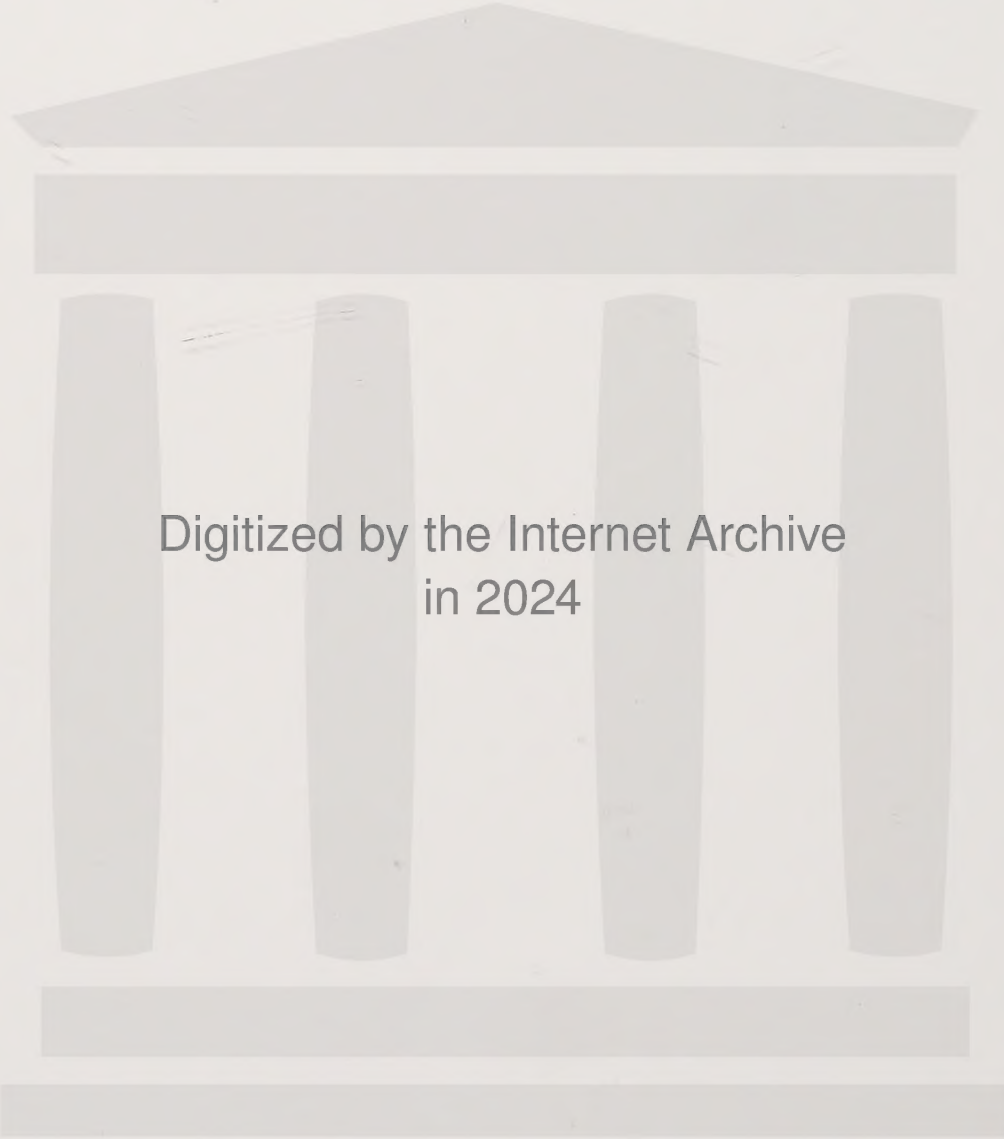
16 - 18 SEPTEMBER 1997

Volume 2

Conference Proceedings



NSW Agriculture



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9th Biennial Noxious Weeds Conference

Volume 2 Conference Proceedings

**Dubbo RSL Club
Dubbo
September 16-18, 1997**

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Conference Convener
NSW Agriculture
Dubbo**

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Host council

Dubbo City is pleased to be the host for conference delegates and organisers.

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Cobbett Pty. Ltd.
Workcover New South Wales

The Weed Society of NSW
Dubbo City Development Corporation

EDITOR'S NOTE

Conferences normally present the progress of continuing work, as distinct from final reports. Alternatively, conferences may be used to present completed work that has previously been reported in a "final report" format or in a paper in a scientific journal. Please read the papers within these contexts. Authors are responsible for their own work.

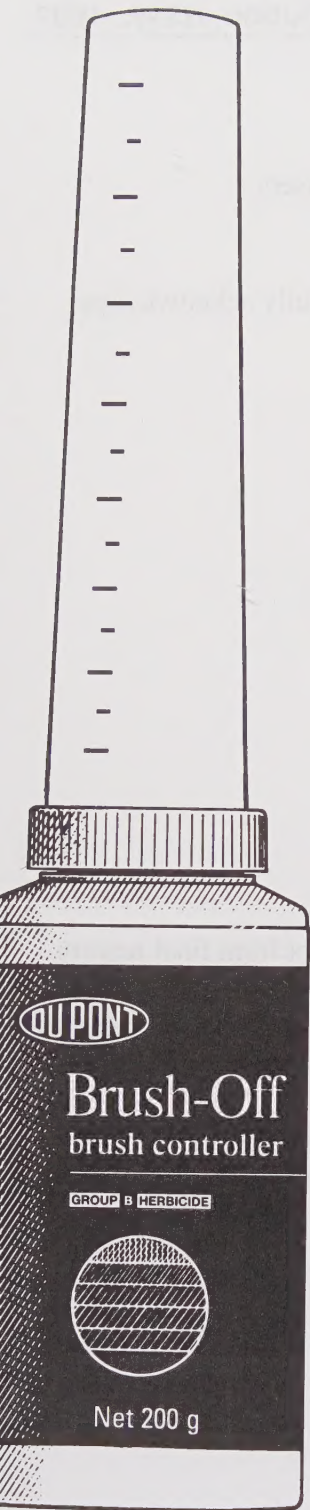
Authors were invited to submit a full paper for Volume 1 - Conference Papers. In cases where authors could not provide a full paper, an abstract was accepted. The full conference papers are published here in Volume 2 - Conference Proceedings. Page numbers continue from Volume 1.

Events that occurred at the conference are appropriately reported here in Volume 2 - Conference Proceedings.

I thank speakers for their help in preparing papers and abstracts.

Further copies of the Papers and Proceedings are available from me at the cost of \$20 posted.

Michael Micheltore
Regional Weed Control Coordinator
NSW Agriculture, P O Box 389, Goulburn NSW 2580
Ph 02 4823 0617. Fx 02 4822 3261.



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Bridal creeper	Lantana	Sweet Briar
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9th Biennial Noxious Weeds Conference

DAY 1 - Tuesday, 16th September 1997

TIME			PAGE
Chairman: George Hammond, Macquarie Valley Noxious Weeds Advisory Committee			
8.30	Introduction	Peter Gray NSW Agriculture	
8.35	Welcome	Cnr Anthony McGrane Mayor, Dubbo City Council	
8.45	Opening Address	Clr Bill Bott President, Shires Assoc.	
9.10	Weed Management in the Modern Community	Richard Groves, CSIRO	1
9.50	The Importance of Noxious Weed Control Programs for Agricultural Industries	Helen Scott-Orr NSW Agriculture	8, 161
10.00	<i>Morning Tea</i>		
Chairman: Val Stubbs, Mid-Western County Council			
10.30	Strategies and Planning for Noxious Weed Control	Richard Carter NSW Agriculture	9
11.00	Appraisal, Benchmarking and Auditing System for LCAs	John Fisher NSW Agriculture	17, 163
11.10	Parthenium Weed Update	Phil Blackmore NSW Agriculture	18
11.20	Headers at Queensland Border	Malcolm Smith, AGHA	166
11.30	Tour of Parthenium Weed Areas in Queensland	Bryson Rees Wellington Shire Council	24
11.40	The Parthenium Action Group's Program in Queensland	Scott Deardon Queensland Parthenium Action Group	26
12.10	NSW Agriculture's Noxious Weed Management Computer Programs	Alan Maguire NSW Agriculture	32
12.30	<i>Lunch</i>		

Chairman: Peter Gorham, NSW Agriculture			
1.30	A Computer Program for Noxious Weed Program Management	Campbell Petterson Kempsey Shire Council	169
1.50	Weed Mapping using GPS and Remote Sensing	Ian McGowan NSW Agriculture	33
2.10	Aerial Inspections using GPS	Lee Amidy Gunnedah Shire Council	43
2.30	"WeedMap" Software from Neumaflo for Noxious Weed Administration	Scott Clark, Neumaflo	173
	Pest Management Information Systems (SA)	Sue Southcott, Anadata	48, 174
2.50	Panel Discussion		
3.00	<i>Afternoon Tea</i>		
Chairman: Graham Matthews, Bellingen Shire Council			
3.30	Training and Competencies for Weeds Officers	Hugh Milvain NSW Agriculture	49
4.00	Control of Environmental Weeds Utilising Community Involvement	Judie Rawling, Urban Bushland Management Ltd	175
4.30	Proposed Vegetation Management Legislation	Andrew Kennedy and Len Banks, NSW Agriculture	51
5.10	Close.		
	Weed Identification Education Display (on going)	Bob Trounce, NSW Agriculture	
6.00	<i>Evening Meal</i>		
7.30	Weeds Officers Association AGM		180
7.30	Elected Members Meeting		

DAY 2 - Wednesday, 17th September 1997

TIME			PAGE
Chairman: Kate Blood, KTRI, Frankston, Victoria			
8.30	Monsanto: New Products / Developments	Darren Thomas, Monsanto	
8.50	Weed Introductions through Nurseries	Jim Dellow NSW Agriculture	53
9.10	New Weed Introductions	John Hosking NSW Agriculture	58

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9.30	Giant Parramatta Grass	John Betts, NSW Agriculture	64
9.50	Weed Busters Week	Roger Smith Orange City Council Bob Trounce NSW Agriculture	68
10.00	Morning Tea		
Chairman: Brian Bywater, Dubbo City Council			
10.30	Integrated Control of Weeds	Tim Woodburn, CSIRO David Brieze, CSIRO Bill Petit, CSIRO	71, 182
	Including: Distributing Biological Control Agents Distributing Biological Control Agents Bitou Bush Biological Control Program Spray Graze Technique for Weed Control	Paul Lutschini, NSW Agriculture Bob Smith, NSW Agriculture Royce Holtkamp, NSW Agriculture Jim Dellow, NSW Agriculture	74 78
12.30	Lunch		
1.30	Weed Excursion - "Weed problems in a unique situation - the Western Plains Zoo".	Marshall: Brian Bywater, Dubbo City Council	
5.10	Approximate time of return.		
6.00	Evening meal		

DAY 3 - Thursday, 18th September 1997

Chairman: Don Baldwin, Upper Macquarie County Council			
8.30	Alligator Weed	Jim Quinn, NSW Agriculture	81
8.40	Blue Heliotrope	David Newell, Landcare	87
8.50	Bitou Bush	Ian Tye Maclean Shire Council	93
9.00	The Practical Application of Herbicides	Barney Milne NSW Agriculture	106
9.30	Practical Application of the Noxious Weeds Act	Maria Linkenbagh, Cooma	110
10.00	Morning Tea		

Chairman: Michael Rusby, Broken Hill City Council			
10.30	Changing Community Perceptions on Weed Control	Andrew Storrie NSW Agriculture	116
10.50	Opportunities for Conflict Resolution	Rod Ensbey, NSW Agriculture	122
11.10	Changing Community Attitudes	Graham Matthews Bellingen Shire Council	197
11.20	Farming for the Future Program	Todd Duffy, NSW Agriculture	127
11.40	Weed Control in the Semi-Arid Zone	Michael Michelmore NSW Agriculture	131
12.10	DowElanco: New Products / Developments	Chris Love, DowElanco	203
12.30	Lunch		
Chairman: Stan Joyce, Castlereagh Macquarie County Council			
1.30	The Future of Aerial Spraying	Harvey Baker Cotton Australia	140
2.00	EPA and Noxious Weed Control	Angus McDonald, E.P.A.	144
2.30	Du Pont / Macspread: New Products / Developments	Geoff Keech, Macspread	206
2.50	Du Pont Travel Award Report	Dick Honeyman Jerilderie Shire Council	146
3.00	Afternoon Tea		
Chairman: Alan Bushby, Upper Hunter Noxious Weeds Authority			
3.30	Roadside Vegetation Management	Carolyn Woods, NSW Roadside Environment Committee	154, 210
4.00	Roadside Vegetation Management Using Consol Lovegrass	Jim Morrison Leeton Shire Council	155
4.20	Using the Media to Advantage	Robyn Yeo, NSW Agriculture	159, 217
4.40	Conference Closing Address	John Fisher, NSW Agriculture	222
5.00			
Chairman: Bob Trounce			
7.00	Conference Dinner		
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	Delegates		235

IMPACT OF WEEDS ON THE AGRICULTURAL INDUSTRIES

Helen Scott-Orr
Chief, Division of Animal Industries
NSW Agriculture
Orange

- 1) Weeds are a huge environmental and economic burden on New South Wales.
 - \$600 million a year in control and lost production.
 - Few sectors of agriculture are not affected by weeds.
 - There are now over 2500 naturalised plants in Australia, many are weeds.
 - During the past 25 years 296 new species naturalised, about 12 per year.
 - Perhaps half of these become weeds.
- 2) Some examples of the impact of weeds on agriculture are easy to see.
 - Blackberry and gorse encroach on grazing and forestry lands.
 - Seed-heads of spiny burr grass
 - ◊ increase the shive fault of wool;
 - ◊ penetrate the skin causing health problems for livestock;
 - ◊ may double the cost of shearing.
 - Alligator weed and water hyacinth
 - ◊ block waterways;
 - ◊ increase water loss from storages; and
 - ◊ increase the cost of water for agriculture.
- 3) Other impacts of weeds are costly but often go unnoticed.
 - Trace amounts of toxic plants like heliotrope, inadvertently harvested within grain
 - ◊ reduce growth rates; and
 - ◊ over time, kill intensive livestock such as poultry and pigs.
 - The impact of weeds includes secondary effects such as
 - ◊ the use of atrazine which can find its way into the watertable; and
 - ◊ cultivation which leads to breakdown of soil structure and increased erosion.
- 4) Some new impacts of weeds are even less obvious.
 - Under quality assurance programs, producers must declare when they use agricultural chemicals in production.
 - Industries such as viticulture now have a well developed system of quality control and are moving to non-chemical management especially when marketing wines to Europe.
 - Buyers of quality assured products do not differentiate between metsulfuron, dieldrin and chlorpyrifos - **they are all chemicals.**

- 5) This places new challenges on weed control authorities.
 - When planning weed control programs, we must be aware that we could damage the industry we are trying to protect by imposing policies without consultation with industry.
- 6) Government recognises weeds as a major issue.
 - The New South Wales Weeds Strategy
 - ◊ released in August;
 - ◊ provides the frame work for coordination of the effort on weeds.
 - The State provides \$6 million in grants for noxious weed control.
- 7) Local government contributes in the order of \$8 million.
 - Several hundred weed officers are employed by local control authorities to facilitate weed control.
- 8) The skills of weeds officers are the key to the success of control programs:
 - Weeds officers generally are technically skilled; and
 - experienced in regulatory approaches to weed control.
 - Few weed officers are formally trained in
 - ◊ facilitation
 - ◊ extension
 - ◊ project management
 - The Biennial Noxious Weeds Conference is one way the State supports local control authorities.
 - NSW Agriculture is happy to assist further in the development of skills base for Weed Officers especially the facilitation, extension and management skills.

TAKE HOME MESSAGES

- Weeds have a significant impact on most agricultural industries.
- We have a system that will address many weed issues.
- The skills of the Weeds Officers are critical for success.



APPRAISAL, BENCHMARKING & AUDITING SYSTEM FOR LCAS

John Fisher
Program Leader (Weeds)
NSW Agriculture

A formal appraisal system has been developed by weed management staff of NSW Agriculture. The objectives of the appraisal system are:

- 1) For councils/communities
 - Enable comparison (“benchmarking”) of their noxious weed programs with programs in similar areas.
- 2) For NWAC
 - Meet ICAC recommendations to prevent corruption in allocation of Government grants.
 - Assist with setting priorities for grants.
- 3) For NSW Agriculture
 - Provide justification, to Audit Office and Government, for noxious weed grant.
 - Assist with setting priorities for weed research and extension.

The appraisal system also meets the NSW Weeds Strategy:

- 4) Desired outcome:
 - Objectives are achieved in an efficient and cost effective manner.

Action:

- Develop performance indicators for weed control programs and use them to evaluate LCA noxious weed programs.

The appraisal system is also a requirement under ICAC - Principles for Grants Administration:

- 5) Disbursement of grants should be conditional on organisations agreeing to a set of binding conditions which stipulate:
 - purpose of grant
 - anticipated outcome(s)
 - monitoring/evaluation and audit requirements
 - etc
- 6) On-going payments should be dependent on ... work is of satisfactory standard, grant is accounted for through appropriate financial systems, and that costs are verified.
- 7) Evaluation of individual projects should provide verification that:
 - project aims and objectives have been achieved
 - the outcome is of a satisfactory standard
 - appropriate procedures have been followed
 - conditions of the grant have been met

- 8) Performance indicators and a process for evaluation should be established to enable routine evaluation at the end of each funding period and to assist with strategic planning. A substantial review should be undertaken every three to five years. All evaluations and their outcomes should be documented.

Benchmarking

Benchmarking is a management technique to improve competitiveness by outward looking for best practice, learning from that best practice, and implementing change.

Continuous Improvement Cycle:

Planning - Data collection - Analysis - Implementation

Steps include:

- Analyse process - identify goals and critical success factors
- Standardise data collection methods
- Finding best practice
- Initiate improvement

Benchmarking requires commitment from the whole organisation - but NSW Agriculture can assist committed organisations by providing some indices (based on annual returns and statistics) that may be useful in comparing programs.

TRENDS IN NOXIOUS WEED GRANTS

With the development of an appraisal system for Local Control Authorities, there may be a complimentary change in the method that grants from NWAC are applied:

Better defined goals and objectives (quantifiable)

- Submission of management plans with requests for weed declarations.
- NWAC policies - objectives for grants.

Collection of data to quantify outcomes:

- Record keeping.
- Mapping.

APPRAISAL SYSTEM

The appraisal system will follow the following process:

Step 1 - develop “desktop” assessment (standardised documented discussion)

Initial trial with six LCAs being conducted now
Review pilot appraisals in November
Implement state wide

Step 2 - develop indices that could be useful for “benchmarking”

Initially provide indices to LCA + state distribution
Later publish all indices

Step 3 - field inspections?

BENEFITS

There is a range of benefits for weed operations staff from the appraisal system:

- Assist LCAs to improve the effectiveness of their weed control programs.
- Provide information that LCAs could use in submissions to other funding sources.
- Provide data to help convince community/councillors/politicians of importance of weeds.
- Maintain (or increase?) noxious weeds grants.
- Grant funds targeted to obtain greatest community benefit.



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HEADERS AT THE QUEENSLAND BORDER

Malcolm Smith
State Representative
Australian Grain Harvesters Association Inc.

I have grown and harvested wheat for the past twenty years and have seen many changes in that time, specifically with equipment, but also with the type of wheats grown. Although this comments does not relate specifically to the topic - it is still a valid point and one that should be considered.

The researchers creating the "best" wheat to sow have overlooked a very valid point. It was not that long ago that we used to commence harvesting in Northern Queensland and work our way gradually south to Victoria or South Australia with the harvest taking some four months to complete - now all the wheat ripens at once and the harvest is completed in about five weeks.

Because of this haste other problems arose - everyone was in such a rush to meet their commitment that shortcuts began to happen.

With the first outbreak of Parthenium Weed in NSW (not via a combine harvester) the situation was quickly reassessed and over a period of time, this Association in conjunction initially with NSW Agriculture, developed a cleaning program for harvesters which could be classified as basic housekeeping.

As the years have passed this format has been improved upon by continuing to work closely with NSW Agriculture plus, over recent years, liaising with NSW Farmers Association, Noxious Weeds Officers in the northern areas of the State and other relevant bodies.

However, into the more serious aspect of this "cleaning" of a combine harvester. Sounds relatively simple doesn't it - a couple of hours work at most maybe - well that is well and truly in the past - in fact, years ago a "clean down" was relatively easy!

Nowadays, to clean down a combine harvester correctly and have it in a condition that will pass the border inspection, requires some twenty hours of solid work it is not hard to appreciate the cost involved to the owner/operator of a machine.

If you base this as an example on last year's categories a top of the range machine was earning approximately \$250 per hour - therefore the cost of a "clean down" would be around \$5,000 plus the additional costs involved in actually crossing the border and being inspected.

When you know you are due to cross the border, you have to book your combine harvester in for inspection - you have to allow a minimum of twenty four hours for a "manned" crossing and forty eight hours for an "unmanned" crossing.

This in itself is not a major problem except when it rains and you are unable to complete the "clean down" or you are travelling to the border and a part breaks and delays you.

Again it can be argued that a simple phone call would solve the problem but, as we all know, mobile phones are a major benefit but there are still huge areas where they cannot operate nor is there always a farm house close by for you to make a call.

A thorough inspection of a combine harvester takes at least half an hour and you can queue for a couple of hours prior to that, so another day is wasted.

We also recommend to members that they cross at Mungindi, Hebel or Boomi as the general traffic is so much lighter than at Goondiwindi.

This, of course, is not always possible or practical - no one is going to drive out of their way without a good reason, but I prefer to enter NSW in this fashion as I feel it is safer having less general traffic on the road.

The reason for the comment is the fact that, as any large truck driver or combine harvester operator knows, the general public totally ignore signage (oversize), flags, warning lights, pilot vehicles when applicable, etc., all relating to wide loads.

As we well know, the normal motorists ignore roadside warnings that there is roadwork ahead, etc. - it makes our job very difficult as we are not just trying to arrive safely at our destination by complying with the regulations but we also acquire an unfair responsibility at the same time which is to look after the totally inconsiderate motorist so that they arrive home safely to their families!

Having stressed the importance of cleaning down our combine harvesters prior to crossing the border from Queensland into NSW, I would like to close by stressing that the vast majority of our members "clean down" their combine harvesters between jobs and this takes some three to four hours to do.

We also note in our diaries where and when the "clean down" took place. This also applies if we do have a break-down during harvesting - we keep accurate records of when and where with reference to the farmer and we assume that the farmer is now doing this as well.

The farmer should know where every stock float, grain truck, sales representative, stock & station agent or family member has been on the property on any one day.

Finally, having crossed the border many times over the past twelve years, cleaning my machine is part of the business and having the machine inspected ensures that my clients know and are aware of the fact that I practice machine hygiene to the very top standard and I can say that this applies to the members of the Australian Grain Harvesters Association.

We appreciate that not every contractor is a member of this Association, but the top professional operators are members and **that is the point for all of you to remember.**

TAKE HOME MESSAGES

- Headers can be cleaned by following the 19 point cleaning plan.
- Insist that grain growers always select contractors who use the 19 point cleaning plan.



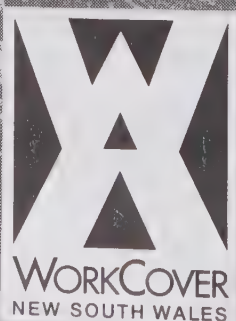


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A COMPUTER PROGRAM FOR NOXIOUS WEED PROGRAM MANAGEMENT

Campbell Peterson
Kempsey Shire Council

Geographic Information

A System of Management For Local Government

Taking the initiative

The Council at Kempsey on the sunny Mid North Coast of New South Wales has established a reputation for innovation in the use of technology within the broad framework of local government.

This is no more evident than in the establishment of a Geographic Information System

The success achieved by Kempsey Shire Council has resulted in their appointment as a business partner of MapInfo Australia. The only local government authority in Australia accredited in such a way.

A council is no different to a large corporation in that most of the information it requires to function, although totally different in its source, application and purpose, has the commonality of relating to one geographic location.

Problems of access to the highly diverse data stored within a local government environment and analytical difficulties have been sources of concern to council managers for a long time. The introduction of PC based geographic information systems to the market, for the first time has given a low cost solution to this dilemma.

The Kempsey Shire Council has established within its GIS approximately 100 map layers. Information is layered over base maps covering data from dogs to flooding to asset management. In fact there are very few applications within the spectrum of local government that cannot be included in a system of this sort. The ability to obtain information, not just quickly, but in a form that is understood and analysed easily, has huge benefits in the day to day management of a local authority.

Basic structuring

The Computer Services Manager at Kempsey Mr Campbell Peterson emphasises the importance of getting the basic structure right in establishing a PC based Geographic Information System. Failure to set the system up correctly reduces greatly the product's results potential. Many councils have outlaid substantial sums of money with very poor results because of inattention to the basics of implementation.

The Kempsey Shire Council has received an award for innovation in local government management for the manner in which it has established its GIS.

CivicView Noxious Weeds

The identification of property details and ownership coupled with a drop down option box enables on-site entry of the details required to generate notification of noxious weeds. Give your noxious weeds officer a laptop and this software and his productivity will increase significantly.

Weed Control Information

Lot ID 4240 X/Lon 302309.08 Y/Lat 1581428.89

Report Information

Report # 97/45

Inspector # 2

Inspection date 4 9 1997

Re-inspect by 4 10 1997

Property

Parcel Area 0.107124 hectare

Location Government Rd

Owner MR COLIN BRUCE CAMPBELL

Land Use MIXED FARMING

Plant Information

Type BATHURST/NOGGGOORA BURRS Category W2

Density Heavy Area Infested 0.05 m²

Action Required Mechanical

OK Cancel Create New

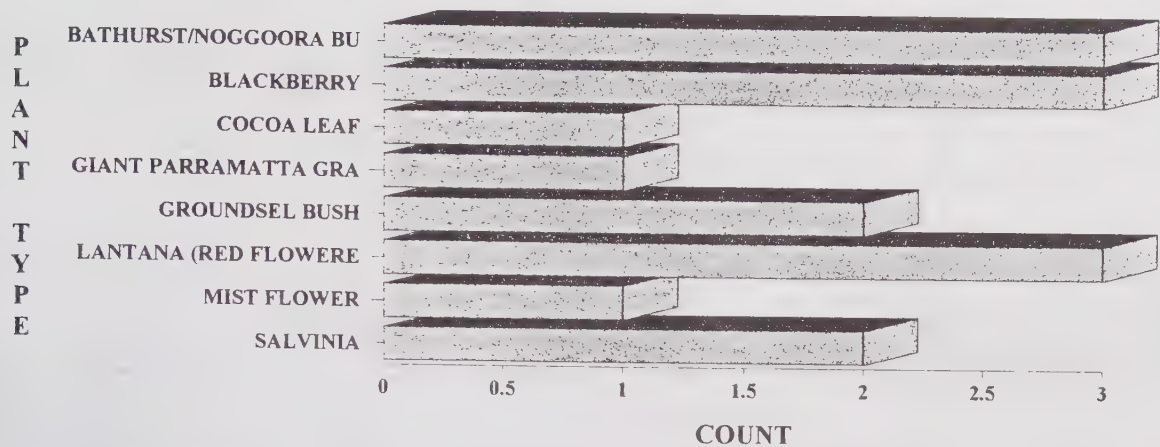
Zoom: 0.945 km Editing: Weeds

Noxious weeds notice generation and the standard drop down entry box to simplify entry.

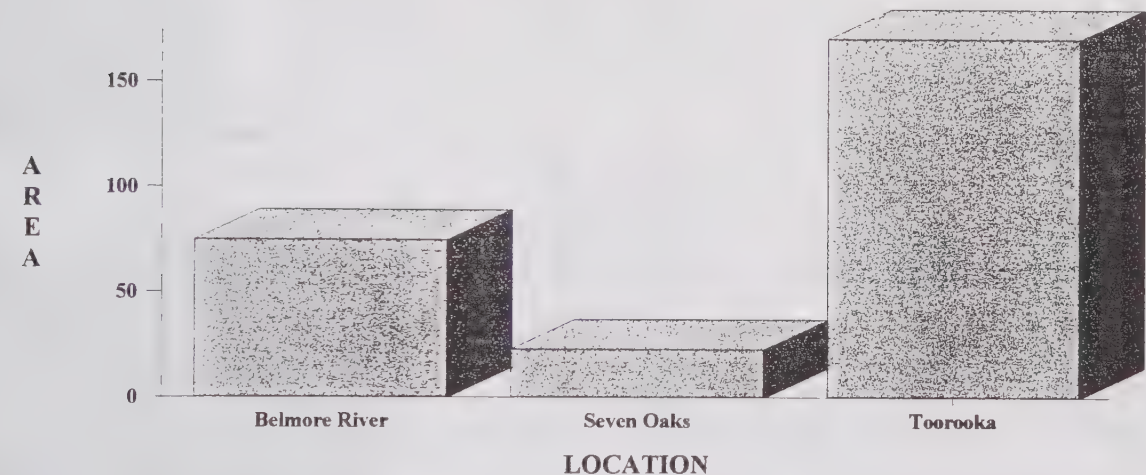
This software also includes PresenTable – a simple to use report writer for MapInfo.

Create your own graphs and reports or produce letters this simple application can do it all.

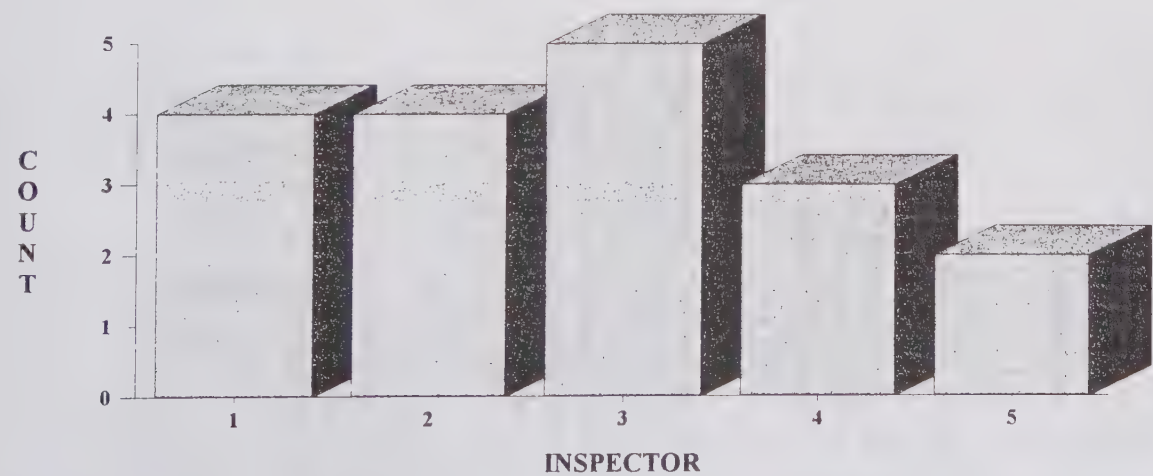
Inspections by Weed



Total Area by Location



Inspections by Officer



CivicView - Inspections Report

Inspector - 1									
Report	Owner	Location	Inspection	Reinspect	Land Use	Plant Type	Density	Area (Ha)	Infested%
3	MS NITA LOUISE THOMAS	Seven Oaks	09/13/97	10/13/97	DAIRY	SALVINIA	Medium	2	15.14
6	NATIONAL BROADCASTING	Seven Oaks	09/13/97	10/13/97	GRAZING	COCOA LEAF	Heavy	4	18.32
16	MR DAVID NEIL DUFF	Toorooka	09/13/97	10/13/97	CLASS A RESERVE	GROUNDSEL BUSH	Light	45	50.15
34	MR JAMES ROSS KESBY	Belmore River	09/13/97	10/13/97	MIXED FARMING	BATHURST/NOGGOORA BU	Medium	20	61.17
Inspector - 2									
Report	Owner	Location	Inspection	Reinspect	Land Use	Plant Type	Density	Area (Ha)	Infested%
2	MRS CECILY FORDYCE WAR	Seven Oaks	09/13/97	10/13/97	MIXED FARMING	GIANT PARRAMATTA GRA	Heavy	8	22.44
15	MR FRANCIS MAHONEY	Toorooka	09/13/97	10/13/97	MIXED FARMING	BLACKBERRY	Heavy	6	24.67
23	MR JAMES NEIL DUFF	Toorooka	09/13/97	10/13/97	MIXED FARMING	BATHURST/NOGGOORA BU	Heavy	20	29.4
33	MR WARREN WILLIAM BLAC	Belmore River	09/13/97	10/13/97	GRAZING	BLACKBERRY	Light	30	12.74
Inspector - 3									
Report	Owner	Location	Inspection	Reinspect	Land Use	Plant Type	Density	Area (Ha)	Infested%
4	MR REUBEN PHILIP SUTHE	Seven Oaaks	09/13/97	10/13/97	MIXED FARMING	SALVINIA	Heavy	4	20.04
5	MRS EVEON GENEVIEVE RO	Seven Oaks	09/13/97	10/13/97	DAIRY	GROUNDSEL BUSH	Light	5	29
12	WARBRO PASTORAL CO PTY	Toorooka	09/13/97	10/13/97	GRAZING	GROUNDSEL BUSH	Heavy	3	0.94
17	MR MAXWELL FRANCIS MAI	Toorooka	09/13/97	10/13/97	MIXED FARMING	GROUNDSEL BUSH	Heavy	23	32.88
24	MR RICHARD JOHN EAKIN	Belmore River	09/13/97	10/13/97	none	MIST FLOWER	Light	2	5.01
Inspector - 4									
Report	Owner	Location	Inspection	Reinspect	Land Use	Plant Type	Density	Area (Ha)	Infested%
9	MR JAMES NEIL DUFF	Toorooka	09/13/97	10/13/97	GRAZING	LANTANA (RED FLOWERE	Heavy	20	16.23
10	WARBRO PASTORAL CO PTY	Toorooka	09/13/97	10/13/97	GRAZING	LANTANA (RED FLOWERE	Heavy	5	15.32
36	MR JOHN BURDETTE SCOTT	Belmore River	09/13/97	10/13/97	GRAZING	BLACKBERRY	Medium	20	24.93
Inspector - 5									
Report	Owner	Location	Inspection	Reinspect	Land Use	Plant Type	Density	Area (Ha)	Infested%
8	MR DAVID NEIL DUFF	Toorooka	09/13/97	10/13/97	MIXED FARMING	LANTANA (RED FLOWERE	Heavy	50	22.99

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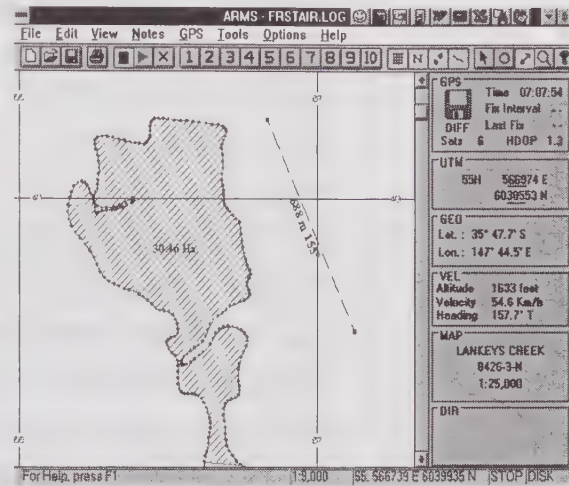
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+

Mapping Software



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COMMUNITY PARTICIPATION
MAXIMISING ITS VALUE

Judith Rawling
Managing Director
Urban Bushland Management Consultants Pty Ltd, Sydney
3/31 Terminus Street, Castle Hill 2154

INTRODUCTION

This paper examines the current trend towards utilising community volunteers to carry out 'hands-on' bush regeneration, tree planting and other environmentally-based activities. Community participation is also encouraged by local government, with many groups acting in a watchdog or advisory capacity on environmental and related issues.

Government at all levels is committed to community participation, and nowhere is this better illustrated than through the Landcare Program managed by the NSW Department of Environment and Planning. At the National level, the Natural Heritage Trust is a new community-based grants program developed to identify worthwhile projects in the environmental arena, and to provide funds for their implementation.

For some years, funds have been available from State and Commonwealth government agencies for planning, research, education and field-based activities. Grants have been made available to government agencies, local councils and to Landcare, Bushcare and other community-based groups, as well as to individuals willing to accept the challenge of reversing land degradation in their local communities.

Community Participation – maximising its value is based on a paper delivered to a conference entitled Science and Technology in the Environmental Management of the Hawkesbury-Nepean Catchment, which was organised by the Institute of Engineers and held at the University of Western Sydney (Nepean) in July 1997.

This paper presented the results of a Community Action Database Survey by the Hawkesbury-Nepean Catchment Management Trust (the Trust), with supplementary information prepared by the author.

BACKGROUND

The Hawkesbury-Nepean Catchment is one of the most complex in Australia, covering 25,000 km², and extending south from the Hunter Valley to Lake George, and west from the Sydney Basin to beyond Lithgow. The Catchment, which is home to 1 million people, is partly urbanised, but remains substantially rural.

When the Trust was established in 1993 by the State Parliament, there was a tremendous amount of community goodwill focused on improving the Catchment. Although its designated role was one of co-ordination (and not funding), the Trust resolved to 'kick-start' the vegetation rehabilitation process by establishing 'Operation Healing' – an \$800,000 grants program available to the community and to local government which focused on much-needed remediation works, and on developing best management practices. Since that time, many

community groups have been formed within the Catchment through Landcare, Council's Bushcare programs, and through the various Catchment Management Committees. In an attempt to identify all individuals, groups and organisations carrying out vegetation management activities within the Catchment, the Trust prepared a Community Action Database Questionnaire (late 1996) which was widely distributed.

The community response confirmed that a large number of people were working as volunteers in a variety of capacities – as bush regenerators, seed collectors, propagators and tree planters. Volunteers are also preparing educational material, raising community awareness through newsletters and field days, and carrying out regular monitoring activities. School groups were particularly well represented (e.g. Streamwatch).

To complete the picture, the author undertook to contact by telephone, all councils and agencies which had not responded, to contact groups/organisations whose responses were ambiguous or unclear, and any bush regeneration contractors and volunteer groups known to be working in the Catchment.

SURVEY RESULTS

Focus Of Activity

Rehabilitation and bush restoration programs in the Catchment revolved around a number of foci. These can be divided as follows:

Community Volunteers	Bushcare, Landcare, Rivercare Groups Progress Associations, Tidy Towns Environmental/Conservation Groups Special Interest Groups
Local Councils	Council-funded bush regeneration contractors Council bush regeneration crews (in-house) Council supported Bushcare/Landcare Groups Reserve Management Committees
Government Agencies	National Parks & Wildlife Service Department of Land & Water Conservation (Landcare)
Other Relevant Bodies	Hawkesbury-Nepean Catchment Management Trust Catchment Management Committees Greening Australia Australian Trust for Conservation Volunteers Men of the Trees

It is obvious from reading survey responses, that the general community see many and varied ways of contributing to bushland conservation and management - not everyone has the capacity or desire to be a 'hands-on' bush regenerator or tree planter. Community groups (and government agencies) involved in education, facilitating, monitoring and in general 'lobbying' activities must be seen as active workers for the cause of bushland conservation. These activities deserve our political, financial and, wherever possible, 'hands-on' support.

What We Learned

There is no doubt that a large sector of the community is willing and able to help government and agencies such as the NPWS in the care and management of native bushland: to work hard clearing weeds and replanting degraded areas, and in re-creating habitat for native wildlife. Expanding community-based programs in all parts of New South Wales are ample proof of this commitment, and while the community retains its enthusiasm, our political masters will be forthcoming with grants and other forms of support.

In return for their efforts, the community make some requests. All these requests are eminently reasonable, but possibly because some items are so mundane, or commonly available to paid workers, they are often overlooked. Responses (written and oral) were grouped, and generally fall into the following categories:

- funding (discounts available to group, security of on-going grant programs)
- practical back-up support (eg: materials, tools, plant material [seed, tubestock], attention to point-source impacts)
- labour/members (everyone wants more!)
- technical advise (educational material, field days, database information, 'someone to ask')
- community nursery facilities, a workspace, or just 'somewhere to meet'.
- better management 'from above' (eg management plans & strategies to establish project goals and future directions)
- on-site leadership/direction to keep group activities on track, to train new workers, and provide enthusiasm
- help with group dynamics (to keep it going), financial management of grant funds
- moral/political support from council, government agencies and community in general
- networking between groups (sharing information, resources, experiences)
- recognition (a bit of thanks from time to time)

Looking at the wish list above, it is possible to pick out some items which are already catered for by various groups/agencies and by existing conservation-based programs. These are: funding sources, technical advise and networking. Indeed, there is a plethora of co-ordinators, facilitators and liaison officers around whose job is to do just that. How well this is done, or how much they interact is another issue - and one we cannot address in this forum.

Issues such as practical back-up support, access to facilities, and (in part) help with group dynamics are provided by councils with well structured Bushcare/Landcare programs or by related groups/organisations within the Catchment.

From the author's experience with community groups and with local government, I suggest that we often fail to address other issues which, if ignored, can and do lead to the demise of the best-intentioned community group. These include:

- lack of leadership and direction from council - enthusiastic groups are formed (often after a public meeting) and set to work by council officers who have not thought through their commitment, or considered the negative effects of 'setting a group loose' on a patch of bush, (eg. we have 20 people for a working bee on Saturday, where shall we put them?)
- failure to develop reserve management plans or rehabilitation strategies to give the group a firm direction, to streamline work activities in order to achieve sustainable results (eg first

we grow the trees because everyone wants to grow trees, then we have to look for somewhere to plant them!)

- failure to provide on-site leadership - a team leader or supervisor who can direct activities to the works plan, manage group dynamics, resolve conflicts, organise appropriate materials and other backup support and provide (correct) technical advice (eg. overheard at a local council - "we have a group working next weekend – is anyone free to look after them?").

CONCLUSION

While there are many community groups willing to give time and resources to restoring and managing native bushland reserves and parkland, there is an untapped resource, not only of labour but of goodwill and enthusiasm, waiting to be mined.

However, before that happens, agencies and organisations specialising in conservation-related programs must address the problems raised by those people already involved and remedy those omissions identified by the Community Action Database Survey and similar survey programs. While it is highly commendable (and necessary) to have a whole network of co-ordinators, facilitators and liaison officers, what the community wants is an increased commitment, better practical support and a presence at the coalface.

TAKE HOME MESSAGE

The message sent by existing community groups is clear.

- WORK WITH US!
- DON'T TELL US, SHOW US!
- BE THERE!

REFERENCES

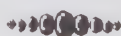
Hawkesbury-Nepean Catchment Management Trust (1995). Time for Action - A Draft Framework for Vegetation Management in the Hawkesbury-Nepean Catchment. HNCMT, April 1995. Windsor, NSW.

Hawkesbury-Nepean Catchment Management Trust (199?). Streamwatch - Community Action Reports in the Hawkesbury-Nepean Catchment. HNCMT, Windsor, NSW.

Hawkesbury-Nepean Catchment Management Trust (199?). Operation Healing - the True Story, HNCMT, Windsor, NSW.

Hawkesbury-Nepean Catchment Management Trust (1996-97). Community Action Database Questionnaire. Unpublished internal document, HNCMT, Windsor, NSW.

Rawling, J.L. (1997). Bushland Restoration and Rehabilitation in the Hawkesbury-Nepean Catchment in Proceedings, Science and Technology in the Environmental Management of the Hawkesbury-Nepean Catchment. University of Western Sydney (Nepean). Institute of Engineers, Western Sydney Regional Group.



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NSW NOXIOUS WEEDS OFFICERS ASSOCIATION
REPORT 1997

Bryson Rees
Wellington Council
Wellington

Following the Annual General Meeting a full new executive was elected along with regional delegates. Some forty (40) officers attended the meeting with some complaints and successes being discussed.

To the outgoing committee, thank you for your work and efforts over your term in office.

The aims of the new committee will be to rebuild member numbers, coordinate training into one with two of the new committee currently working on a training program that will go to NSW Agriculture. A move will be made to speak with Local Government and Shires Association to seek recognition of our trade and not push it under "Truck Drivers" or "Beach Inspectors", etc.

Over the next twelve months a move will be made to have a representative from the local Government and Shires Association speak to us at our AGM in September 1998. Another high priority will be to have newsletters and other information coming to us, it has to be a two-way street.

One of the big incentives that is being worked on for financial members is exchange - six weeks working Study Tour to American in the winter of 1999. This will be done by a draw for financial members only with the draw being carried out at the AGM in September 1998. At this point, I must congratulate and thank past President, Kim Belairs for her work in this area and I hope that Kim's hard work will see the exchange program up and running. We will keep you informed on the progress.

Annual subscriptions are now due at \$20 per year and it would be appreciated if these were paid by the end of November 1997, please. Just remember, you must be financial to be in the draw for the American trip. For those who are unaware, Ron Baker from Narrabri Shire was made a life member at the last meeting - congratulations Ron!

Another idea of the new committee is to look at the purchase of a tie for members to purchase, as there are no badges remaining. The full list of office bearers is:

President: **Bryson Rees**
35 Oxley Circle
Dubbo NSW 2830
Ph: (014) 636655

Secretary: **Roger Smith**
"Mandalay"
Ophir Road
Orange NSW 2800
Ph: (019) 157895

Treasurer: **Kevin Nelligan**
98 Darling Street
Cowra NSW 2794
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Publicity Officer: **Val Stubbs**
6 Burgundy Road
Mudgee NSW 2850
Ph: (02) 63721300

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“Osterly”

The Rocks NSW 2655

Ph: (02) 69202080

Kevin Burton

80 Quarry Road

The Oaks NSW 2570

Ph: (02) 46571111

Jim Cherry

“Beaudell”

Quipolly NSW 2343

Ph: (02) 67461755

Ken Hayes

110 Jordans Way

Korora NSW 2450

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Ian Borrowdale

77 Boorawine Terrace

Callala Bay NSW 2541

Ph: (02) 44293468

Val Stubbs

6 Burgundy Road

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TAKE HOME MESSAGE

Communication creates happiness and growth, it takes all of us to make this happen. Be a part of it!



BIOLOGICAL WEED CONTROL AS A PART OF OVERALL WEED MANAGEMENT

D T Briese, W J Pettit and T L Woodburn
CSIRO Entomology\CRC Weed Management Systems, Canberra, ACT
J Fisher
NSW Agriculture\CRC Weed Management Systems, Orange, NSW

INTRODUCTION

In its early days biological control tended to be viewed as a panacea for weed management - a permanent solution that would replace other costly, time-consuming and environmentally-unfriendly means of control. This view was reinforced by well-known cases such as prickly pear, and more recently the narrow-leaf form of skeleton weed and the aquatic fern, salvinia, where introduced control agents were responsible for the reduction of enormous areas of weed infestation. However, such dramatic successes represent a small proportion of the 50-plus control projects that have been or are being undertaken against weeds in Australia. The more common story is for agents to make an important contribution toward the control of the target weed, but not to be able to reduce it to non-damaging levels at all times and in all places (e.g., St John's wort (Briese, 1997) and blackberry (Bruzzese & Lane 1996)). This is particularly so for terrestrial weeds that have long-lived seed banks, and increasingly weed biological control is being viewed as one of a number of options for managing weed populations.

Both the recent National Weeds Strategy (1997) and the NSW Weeds Strategy (1997) point out that, in most cases, the only practical sustainable options for managing weeds will involve an integrated approach using all available technologies. To date, however, there has been little conscious effort to incorporate biological control into overall weed management (but a notable exception is management of salvinia in Kakadu (Julien & Storrs, 1996)). It is more often considered a bonus that occurs independently of active weed control programs. The challenge for weed control practitioners is to build biological control, where it exists, into integrated approaches to maximise its impact and benefit from possible synergies with other control methods. However, because the life-cycles of biological control agents are no longer determined by human intervention once they have become established, such integration requires one to build the other control options, such as grazing management and herbicide usage, around the activities and impact of the agents.

This paper attempts to put biocontrol of weeds into a framework to develop an understanding of the potentials and limitations of biocontrol in agricultural systems, and to suggest what is needed in the way of research and weed control practice to maximise this potential. The paper addresses a number of topics:

- the legislative framework in which biological control must operate
- the scientific framework required to develop workable weed control strategies
- the practical aspects of delivering weed biological control
- realistic expectations of biocontrol agents and the role of landholders in maximising their impact
- integration of biocontrol with other weed management methods

THE LEGISLATIVE FRAMEWORK OF BIOLOGICAL CONTROL

The Australian Weeds Committee, members of which are drawn from Federal, State and Territory departments, is the body that declares a weed as a target for biological control. This recommendation then needs to be ratified by the Standing Committee on Agriculture and ultimately the Australian Agricultural Council before approval to implement biocontrol may proceed. The provisions of the Biological Control Act 1984 (Anon. 1984) also allow for declaration of target weeds, as well as providing a mechanism for the resolution of conflict of interests (see Cullen & Delfosse 1985).

The Noxious Weeds Act (Anon. 1993) makes no mention of the use biological control agents in the control of noxious weeds. However, policy is outlined in the Noxious Weeds Advisory Committee Policy Paper 4 (Anon. 1995) on the use of biological control in response to a notice to control a noxious weed. Landholders have a 'duty of care' towards their neighbours, and it is the responsibility of local control authorities (LCAs) to enforce the provisions of the Noxious Weeds Act and to prevent weed spread to other properties. The policy reiterates that biocontrol agents take time to build in numbers and to exert an influence on a weed population. Furthermore, it encourages the use of biological control in appropriate situations, and gives authority to the LCAs to decide at the individual property level whether biocontrol is appropriate or not. It does, however, state that landholders may not use it as an excuse for not carrying out their responsibilities under the Noxious Weeds Act. The policy recommends:

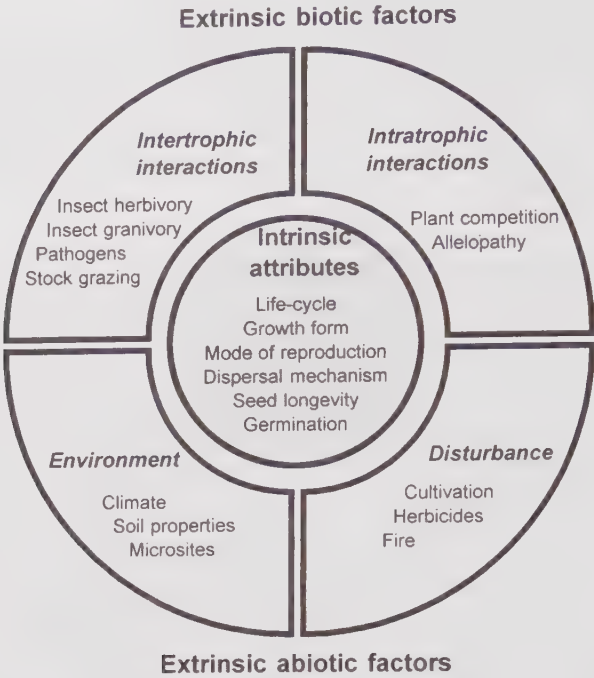
1. the use of a buffer zone between properties to protect neighbours,
2. that the time period for the continuance of this zone be specified, and
3. that regions be zoned into areas suitable or otherwise for implementation of biocontrol.

THE ECOLOGY OF WEED SYSTEMS

As well as a legislative framework, it is important to the success of biological control (and particularly to its incorporation into overall weed management strategies), that there is an appropriate scientific framework. The key to effectively manage weeds is an understanding of how the target weed affects and is affected by the system in which it occurs. This not only involves knowledge of intrinsic biological attributes of the weed, but also they way in which external factors, both biotic and abiotic, influence the dynamics of weed populations (Fig. 1).

Weeds have a range of intrinsic biological attributes, which are particularly important for biological control, as the life-cycle of the control agent is tightly linked to that of its host weed (see Briese 1993). Weeds may be annual, biennial or perennial; they may have grassy, herbaceous, shrubby or woody structures; they may reproduce vegetatively, by seed or both; they have different ways of dispersing and some may form large long-lived stores of viable seed in the soil. All of these properties need to be considered when selecting potential biological control agents and will have an influence on how successful an agent might be. For example, short-lived annual plants, such as heliotrope, may be particularly difficult targets for biological control. For this type of plant it is necessary to find an agent that can respond rapidly when plants germinate and build-up to effective densities within a season before the plants can set seed. Many insects are not capable of such a rapid response and the most likely candidate agents are pathogens. Some weeds that reproduce through seed alone (e.g., thistles) can be controlled by cultivation and cropping, whereas others that can reproduce vegetatively (e.g., skeleton weed) will only be spread by this means. Skeleton weed provides a good example of a biocontrol agent, the *Puccinia* rust fungus, with high powers of dispersal and increase that has been able to control a weed which does not have long-lived dormant stage.

Fig. 1. Schematic life-system of a weed showing factors that need to be considered or understood when developing control strategies.



Many weed species, such as Paterson’s curse and the *Carduus* and *Onopordum* thistles, do have such a stage, in the form of a long-lived seed bank. This makes them particularly intractable for long-term control. Studies on the longevity of seed banks suggest that even with no further seed input it will take many years to exhaust seed reserves already in the soil. It takes four years for a 50% reduction in viable *Onopordum* seed in the soil, and if control is lifted and plants allowed to seed during that period the soil reserves are rapidly replenished (Allen & Holst 1996). Biological control, once in place, probably offers the surest way to maintain pressure on soil seed reserves, as it is the only option that will work independently of human intervention.

The biotic external factors may operate on the same trophic level, like plant competition, or may operate between trophic levels, in the case of herbivory. Both are amenable to manipulation; through pasture management / vegetation composition and stock grazing / biocontrol, respectively (Fig. 1). Abiotic factors fall into two types; environmental, such as soil properties and rainfall, which are not amenable to human modification, and disturbance, where humans can most directly intervene through herbicide applications, cultivation and/or fire (Fig. 1). In natural environments, some of these options are not appropriate (e.g., grazing management, broadacre herbicide use) and biocontrol becomes an even more important component of management strategies.

The life-cycles of weeds can have varying levels of complexity, and two extremes of this are given in Figs 2 and 3. Species with simple annual life-cycles (Fig. 2) generally germinate over a short period and develop as a single cohort thus allowing the use of control options such as well-timed herbicide applications or grazing management (e.g., restrict grazing prior to the germination period to enable competition from other pasture vegetation to reduce weed seedling numbers and vigour or graze strongly when plants are young and palatable). Often these individual methods are insufficient on their own, but combining these practices with

biological control may well enhance the effectiveness of agents that reduce vigour but do not kill plants (see Groves 1996).

Fig. 2. Life cycle of an annual weed without a long-lived seed bank and which does not reproduce vegetatively. (+ indicates a positive effect and - indicates a negative impact on the weed. Factors in grey are amenable to management intervention, those in black are not)

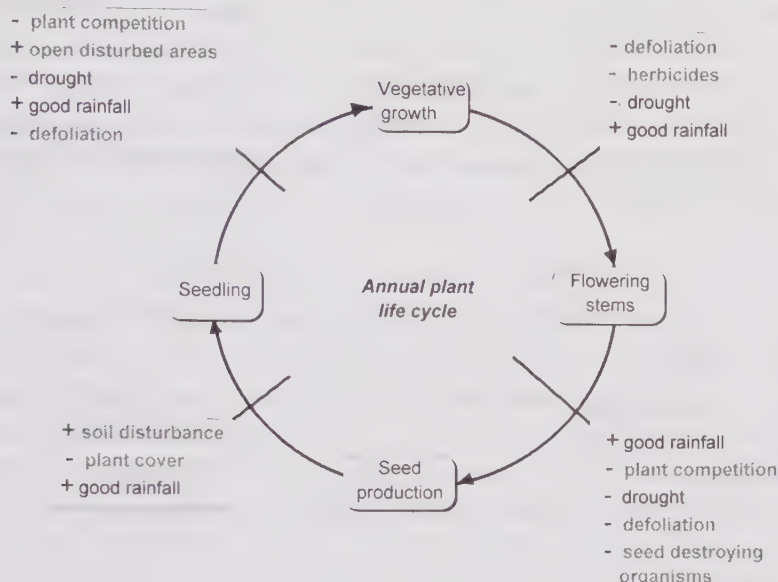
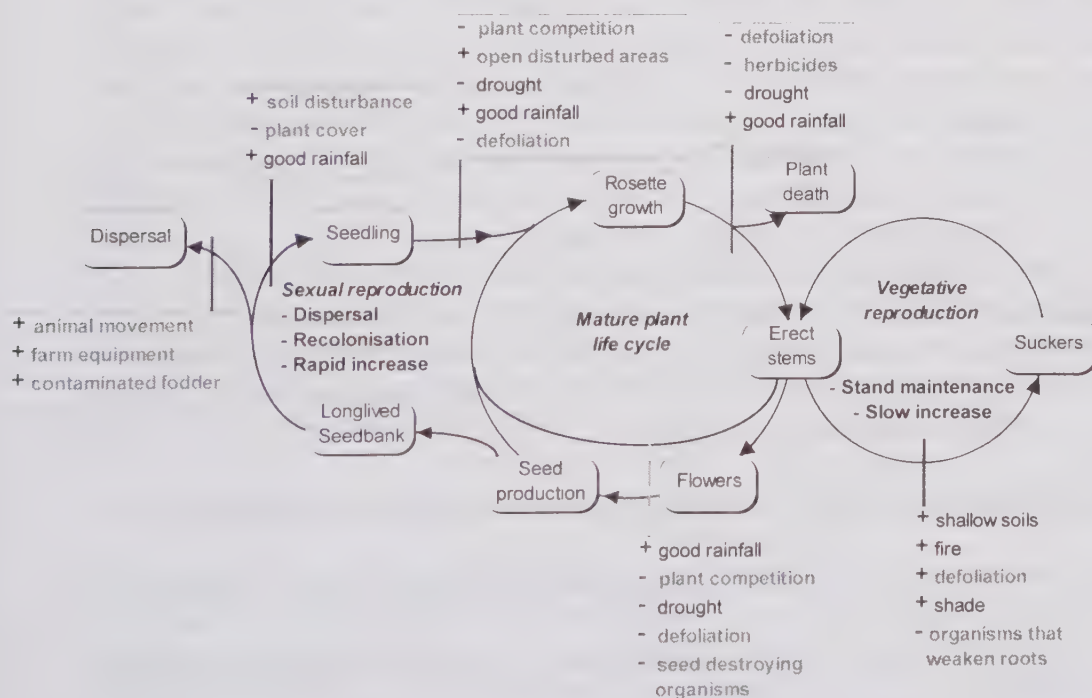


Fig. 3. Life cycle of a perennial weed with both vegetative and seed reproduction and a long-lived seed bank (e.g. St John's wort). (symbols same as for Fig. 2)



Complex life cycles (Fig. 3) need not necessarily make a weed more difficult to control. Although the weed has more ways of escaping from control methods (e.g., stimulation of vegetative reproduction by herbivory) or avoiding them (e.g., seed dormancy and soil-seed

banks), there are more possibilities for intervening in the life-cycle of the weed (Fig. 3). Many biennial and perennial broadleaf weeds spend a large part of their life-cycle as rosettes, which makes them vulnerable to a guild of meristem- and root-feeding biocontrol agents, as well as being susceptible to competition over a longer period. Failure to control the weed through attack at one point of its life-cycle should lead to research on its vulnerability at another. For example, while herbivorous *Chrysolina* beetles have had some impact on St John's wort, they have not been able to offer long-term or widespread control of it, as the weed can recover from defoliation due to large nutrient reserves in its roots and a capacity for suckering. This led to research for agents that could exhaust these root reserves and slowly kill the plants, resulting in the release of the highly promising *Aculus* mites (Briese 1997). Long-lived soil seed reserves pose a special problem, but can be attacked from two aspects; prevention of germination through pasture management and plant competition, and long-term reduction, through the prevention of seeding. It is here that biological control agents can be particularly useful.

Germination requirements can have an effect on the success of different control methods. For example, *Onopordum* thistles can germinate in several flushes over much of the year (Pettit *et al.* 1996), producing stands of varying age and herbicide tolerance, thus making control difficult. However, if the trigger for germination is known, such as the case of fire and bitou bush, this can become a management tool, by stimulating massive germination and then applying a second control measure at the vulnerable seedling stage (see Holtkamp, Vol 1 pp 74-77 of these proceedings).

A thorough understanding of weed ecology is not only necessary for improving the success of biological control, it is critical for any integration of biological control into weed management strategies. It is not only important to identify where in the life-cycle of the weed a control option can be successfully applied, but to know whether intervening at that stage is going to be effective in the long-term, i.e., does it matter if we can kill 90% of seedlings if most would have died through plant-thinning anyway and the remaining ones can still form an infestation that causes problems. One way to do this is by modelling the weed population dynamics (see Shea 1996). This can enable the critical transitions in a weed's life-cycle to be identified (e.g., is it more effective to reduce seed output directly or to target the young or mature rosettes in a broadleaf weed). It can also determine the target control levels needed and predict how well agents are likely to achieve these. For example, a model by Shea & Kelly (see Shea 1996) predicted that in New Zealand, seed reduction levels of 65% would be necessary to cause decline in nodding thistle densities. Such models are also useful tools for studying the impact of other weed control options, such as grazing management and tactical herbicide usage. A detailed understanding of weed ecology is, therefore, the key to integrating the various options and producing more effective management strategies.

RELEASE AND ESTABLISHMENT OF BIOLOGICAL CONTROL AGENTS

All biological control of weeds projects have several common sequential stages. These are:

1. the initial exploration phase, in the target weed's native range, for potential pathogens/arthropods;
2. the quarantine phase, where the selected agents undergo host testing to demonstrate their specificity;

3. the release and redistribution phase which can be subdivided into 3 stages of varying duration: years 1-3, the initial releases, usually of a research nature: years 2-4, releases made by State collaborators: years 3-6, rapid expansion of redistribution networks; and
4. the monitoring of agent performance phase.

The initial exploration phase

The underlying philosophy of both weed and insect biological control is that an exotic pest is such because it has been introduced to its new environment free from those organisms that limit population growth in its native range. Biocontrol science endeavours to restore an ecological balance in the new environment that existed in the native one. The selection of potential biocontrol agents is a crucial part of any biocontrol project. Such selection is made, not only in the target weed's native range, but if possible in the centre of origin of the weed, e.g., whilst skeleton weed occurs throughout Europe, north Africa and western Asia, its centre of origin is in Turkey, where the search for strains of the rust fungus *Puccinia chondrillina*, that would infected unattacked strains of the weed found in Australia, has been concentrated in recent years. The prime consideration of strict specificity greatly reduces the number of potential agents.

Selection of potential organisms is helped by detailed, intensive study and sampling of the weed. This leads to an understanding of its life cycle and the influence of arthropods and/or pathogens on limiting weed population growth. Recent European studies on thistles illustrate this point well. Seed production in nodding thistle, *Carduus nutans*, which is (mostly) a biennial species, was reduced by up to 99% by four insects that attacked the seed heads (Sheppard *et al.* 1994). Soil seed banks were found to be an order of magnitude lower in Europe than in Australia, hence the decision was made to initially concentrate on insects that limited seed production (Woodburn 1993, Woodburn & Cullen 1995). In marked contrast, a similar study on the annual slender thistle, *Carduus pycnocephalus*, found no evidence that insect herbivores were limiting seed production in this system, although these two thistle species overlap in Europe and share over 90% of insect species (Sheppard *et al.* 1991). However, the latter study identified a rust fungus, *P. cardui-pycnocephali*, as the agent that offered the most potential, and this was eventually imported into Australia (Chaboudez *et al.* 1993) and released.

When potential agents have been identified in the home range of the weed, basic studies on their biology are carried out, if these are poorly understood, in order to facilitate rearing under quarantine conditions in Australia. Preliminary host specificity testing against closely related plants of economic importance may be undertaken at this stage, e.g., testing globe artichoke in thistle biocontrol projects.

The quarantine phase

Permission to import a biological control agent into quarantine must be obtained from the Australian Quarantine and Inspection Service (AQIS) and Environment Australia (EA). Insects that originate from the northern hemisphere require synchronisation with the season in Australia. Insects shipped in diapause must spend several months at low temperatures to simulate a European winter. Conversely, if ovipositing adults are shipped, plants at the right stage need to be provided, e.g., when *Melegethes planiusculus* was introduced, flowering Paterson's curse had to be provided during the Australian winter.

The quarantine phase has three very important functions. Firstly the agent, be it arthropod or fungus, must be reared through at least one generation to ensure that it is free of its own pests and diseases, e.g., *Rhinocyllus conicus* release was delayed for 12 months whilst the culture was screened of the debilitating protozoan disease *Nosema* sp. (Woodburn & Cullen 1995). Secondly, it is necessary to demonstrate that the agent has a very limited host range, preferably restricted to the target weed and its close weedy relatives. The importing organisation draws up a host test list, incorporating plants of both economic and conservation importance. This list must be agreed to by 21 federal, state and territory agencies drawn from both agriculture and conservation areas. Test plants are, in the first instance, those that belong to the same genus as the target, then representatives of the same tribe, and other tribes, within the same family. Plants may also be included from closely related plant families. Commonsense applies to the inclusion of each species, i.e., if testing a stem boring insect it is pointless to include plants that never form a stem.

Testing of arthropods is usually done first with 'no choice' tests, where sexually mature insects are introduced into cages containing the test plant. In some cases there can be adult feeding damage and/or egg laying under such a severe test. When this happens 'choice' tests are used, where the test plant and the target weed are offered in the same cage. In practice if a confirmed positive test is observed in very closely related plants, testing will cease and the insect colony destroyed. Host testing is very demanding on both labour and time, but is absolutely essential to ensure the safety of weed biocontrol. The host testing method is very artificial and can indicate a wider than expected host range. Testing of the leaf hopper *Tettigometra sulphurea*, a potential agent for *Onopordum* thistles, showed that oviposition and larval development occurred on globe artichoke, which is a commonly cultivated in Europe, but has never had this insect recorded as a pest. Once it has been established that neither plants of agricultural or environmental importance are under threat, permission is sought from AQIS and EA, via the 21 reviewers, for its release. The rigour of host testing is attested to by the fact that so far there has not been, anywhere in the world, attack on non-target plants that had not been foreseen and deemed acceptable by reviewers. Finally, the founder culture of the agent must be reared for release into the environment. This is usually achieved in conjunction with the host testing, since the agent is returned to its weed host between individual tests to ensure that the insects are still reproductive.

The release and redistribution phase

The initial release of an agent is generally done with very low numbers of insects, since rearing conditions in quarantine are of necessity artificial, and often far from ideal. The agent is usually caged over the target weed to prevent early dispersal and allow the insects to easily find mates, and also to help the researcher monitor the progress of the release. Field establishment of the agent and build up in numbers sufficient to permit redistribution may take from one to several years. This time lag is mainly due to biological attributes of the control agent, i.e., the egg laying potential and the number of generations per year. Biotic factors such as availability of the weed and rainfall at the right time may also be important.

The next phase in release and redistribution is the provision of starter colonies to State collaborators, such as Departments of Agriculture and Departments of Conservation, for them to establish nursery sites. This technology transfer involves more than just handing over the control agent. The researchers involved in the initial part of each project prepare detailed notes on all aspects of agent rearing and establishment. These include the biology of both weed and insect, with emphasis on the critical part of these cycles for intervention by the

landholder. Information is also included on current best practice for managing the nursery site to ensure a regular supply of the weed.

Increasingly over recent years there has been a tendency to form redistribution networks to systematically redistribute the biocontrol agents, initially at strategic points within the range of the weed. These networks are developed by CSIRO, the State agencies and Shire Weed Officers and usually rely on the involvement of community based organisations such as Landcare. The role of community involvement in these redistribution networks has recently been extensively reviewed by Briese & McLaren (1997). The third phase of redistribution is at this local level, with the State collaborators harvesting agents from their nursery sites and passing them on to the community based groups. Here the emphasis is on establishing release sites on individual farms for further rearing and local dispersal within and between farms.

The monitoring of agent performance

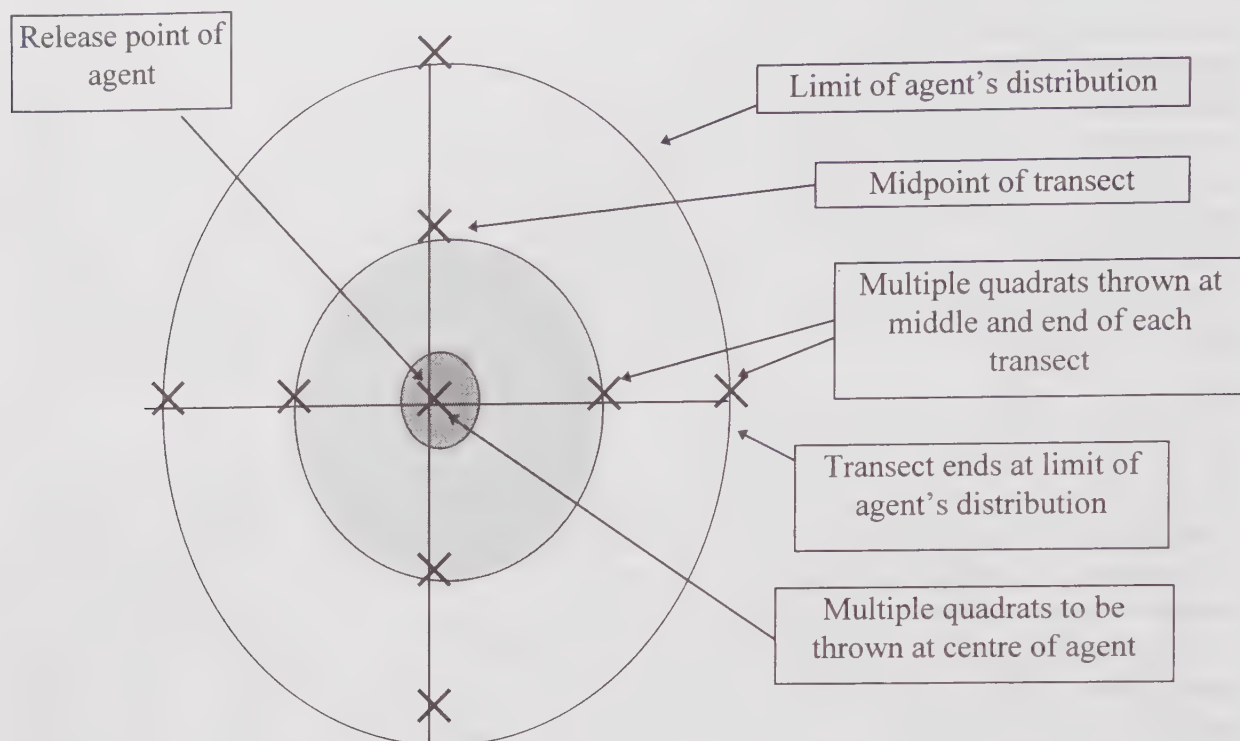
This crucial part of a biocontrol project is typically undertaken at different levels of intensity. Initially, detailed assessment by the research team focuses on the impact of an agent at the micro level e.g., extended regular sampling of individual weeds or small weed patches. This detailed study is expanded to the plant population level as agents begin to disperse. Such studies involve regular sampling of the target weed to document the interaction between weed and agent. Emphasis is placed on such parameters as growth and development of the weed and whether its reproductive potential is limited by the released agent. In those systems where it is appropriate the soil seed bank is also closely monitored. Two examples of agent performance on St John's wort and nodding thistle are reported by Jupp & Cullen (1996) and Woodburn (1996), respectively.

The second level of monitoring occurs at the State level by the State collaborators, where an annual measure of spread and impact is assessed at a few selected sites over the range of the weed infestation. The aim here is to obtain quantitative data on the spread and number of the agent present at 10 representative sites throughout the weed's range. Spread is assessed by recording the distance from the release site to the furthest attacked plant in the four compass directions (Fig. 4). Severity of attack is recorded by counting attacked plants in randomly placed quadrats at the release site, at the limit of distribution of the agent and at a point midway between. Ideally at least 10 counts should be taken at each site and records are entered onto a data base by the collaborators.

The third level of monitoring is simpler, and data on establishment and spread are recorded as above, but without plant counts. This level of monitoring, designed to monitor agent establishment, should be undertaken at all initial release sites on any given farm or conservation area. Records are collected by the collaborators and similarly entered onto the data base.

This sampling protocol has been designed to assess agent impact over the range of the weed in Australia. Estimates of insect numbers and attack rates at all sites for which establishment is noted can be inferred from the more detailed data collected at the selected monitoring sites. Similarly assessments of agent impact on weed performance can be made by using the detailed data collected from the research sites.

Figure 4. Schematic diagram of transects running through biological control agent release site for monitoring purposes



LANDHOLDER COMMITMENT AND CONTRIBUTION TO BIOLOGICAL CONTROL

There is enormous potential for biological control agents to reduce the significance of certain weeds in pasture situations, since, in the absence of natural predators and parasites, they have the potential to establish populations that are much larger than any to be found in their native range. When a number of biocontrol agent species that attack different stages of a target weed's life-cycle are established, this potential for impact on the target weed is even greater. As more agents are released through New South Wales for the control of weeds, landholders, county council weeds officers, district agronomists and Landcare groups will increasingly become more involved in the redistribution of biological control agents around the state. What then must landholders do to maximise the impact of control agents on individual weed species, and what are the realistic outcomes of biological control projects?

Agent impact on the weed

Biological control agents are released in the hope that they will establish at a release site, that their population will increase locally to a level where damage will impact upon the weed infestation, and that the population will gradually spread out into the surrounding weed infestation. At low numbers, it is likely that a population of biological control agents will impose a very small stress on their host plant and do little to change the dynamics of the plant's life cycle. At high numbers, biological control agents can impose major stresses to a plant at different stages of its life-cycle. Such stresses can compromise a plant's ability to set seed, reduce plant vigour making it less competitive with beneficial pasture species, or even kill the plant. It is therefore essential that a large effort is invested in establishing agents throughout the range of the target weed and in ensuring that established agents are given the best conditions for spreading through local weed infestations.

Assisting establishment

In the early stages of release and establishment a very small population of an agent (often less than 100 individuals) is surrounded by large infestations of its host plant. Dispersal from the release site into the surrounding weeds can mean that males and females cannot locate each other to mate. Alternatively, egg laying may be so dispersed that the resulting progeny will have difficulty in locating mates.

To assist establishment at release sites, shade cloth field cages are often used to prevent initial dispersal of agents. Once egg laying has been observed on plants within the cage, it is often then removed to allow the agents to disperse. As a further measure of protection, the release site must be fenced to provide the agents with an area of weed infestation that will be undisturbed by the activities of stock or the landholder.

Giving the agents a chance to spread

Allowing a small population of biological control agents to establish in a fenced area will amount to very little if there is no surrounding weed infestation for the agents to colonise. The release site and its immediate surrounds should be treated as a sanctuary for biocontrol agents. Rocky headlands, hillsides or lightly timbered areas are often areas that are not priorities for weed control by a landholder. It is likely that such areas would have been given a low priority for weed control for many years and are unlikely to see improvement by cropping or herbicide application in the future. Such sites are ideal for agent release and local build up of the population. However, successful establishment and spread often requires active participation of the landholder to ensure a continued supply of the weed in and around the nursery site.

Information kits are prepared for each biological control agent that is released. These kits provide information on the ecology of both the agents and the weed, and include specific instructions on how to manage the release site to maximise agent establishment and spread.

Redistribution of agents

Although all biological control agents are capable of dispersing by themselves, a faster coverage of the local weed infestation can be accomplished if landholders set up new release sites about their property. Without an active redistribution effort, agents may take many years to spread from a single release site to all infestations on a property. Land-use differences between paddocks may provide natural barriers to dispersal of agents to distant infestations, and prevailing winds may play a part in limiting spread in a given direction. By setting up multiple release sites on a property, a landholder effectively reduces the amount of time that it would otherwise take for an agent to disperse over target weed infestations.

Availability of agents

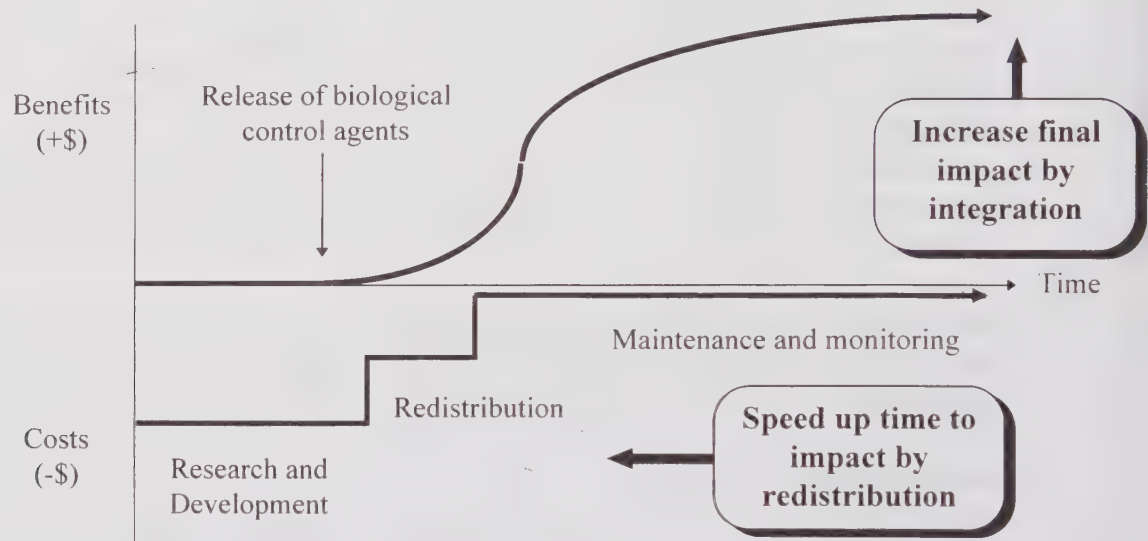
As described previously, host-specificity testing is logistically difficult and very time consuming, so that the testing of all the potential agents for a given weed cannot be done concurrently. What this means for the landholder is that not all agents are necessarily available for redistribution at the same time. For example, while a number of agents are being actively redistributed, some may still be at the establishment phase and yet others in quarantine undergoing testing for their specificity. In the case of *Onopordum* thistles, the first agent (the seedhead weevil *Larinus latiusculus*) was released in 1992. A further two agents have been released

and another is approved for release in 1997. Additionally, three potential agents are currently undergoing testing in CSIRO quarantine facilities and will hopefully be released into the Australian environment in 1998 and 1999.

The best chance for maximum impact

Biocontrol agents may reduce plant vigour or even kill their host plant and, in doing so, improve the productivity of the pasture or biodiversity of the natural environment. Others may reduce seed set, leading to a long term reduction of germinable seed in the soil for those plant species with long lived seeds (e.g., *Onopordum* and *Carduus* thistles, scotch broom, Paterson's curse). However, these benefits of biological control programs are never available immediately upon release of the first agent. The maximum impact on a weed species can often only be realised when all potential agents are distributed and well established over its range.

Fig. 5. Schematic diagram showing how the costs and benefits of a biological control project accrue over time and the two main ways of maximising benefits from the project.



Clearly, expectations of impact of biocontrol agents may vary between practitioners of biocontrol and landholders. The principal difference in expectations is likely to be the amount of time that it will take to establish a number of different agents at a release site, and the amount of time it will then take for those agents to increase in population and spread in order to have broad scale impact upon the target species. Biological control is not, and indeed cannot be, a short term control option for control of weed species. As has been stressed elsewhere in this paper, it is a very useful and powerful part of any weed management program that must be incorporated with other management practices to control weed infestations. Nonetheless, this weed management tool has the potential to greatly reduce, or to even eliminate, a landholder's reliance on chemicals to control targeted weed species in land under their care. An idealised representation of these processes in terms of costs and benefits is presented in Fig 5. Obviously, as illustrated here, landholder participation is an essential component in the accrual of benefits. Contacts for obtaining biological control agents for a number of weedy species in New South Wales are given in the Appendix.

INTEGRATION OF HERBICIDES, GRAZING AND BIOCONTROL

To date biological control of weeds has been used as a 'stand alone concept'. In reality this mentality is putting excessive strain on what is already a delicate balance. To exploit biological control agents (insects, mites and plant pathogens) to their full potential, consideration must be given to a fully integrated approach incorporating grazing livestock, perennial pastures and herbicides (Fig. 5). Already the spray-graze technique is utilised by farmers to capitalise on grazing stock, sublethal herbicide rates and competitive crops or pastures to obtain superior and cheaper control results. Readers are referred to Dellow in volume 1, pp 78-80, of these proceedings for a detailed discussion of the spray-graze technique.

The next step is to incorporate biocontrol agents into the system. However, the possible harmful affects of herbicides on the efficacy of biocontrol agents needs to be assessed as well as the timing of strategic grazing of livestock to avoid adverse results. Preliminary studies by Smyth & Sheppard (1996) indicate that herbicides did not affect rosette feeding biocontrol agents of Paterson's curse, while simulated grazing did reduce their numbers, though to a lesser extent once more mature larvae had reached the rosette crown. The implications are that, to maximise the survival and impact of biocontrol agents in the field spray-grazing would need to be delayed to the end of the period in which it is considered effective (i.e., until late June). Field experiments are clearly needed to see if the combination of these techniques does give improved control. However, it is also critical to remember that it is not easy to manipulate the numbers of control agents; they cannot just be added to an integrated weed management recipe. For benefits to be obtained, it is necessary that the agents are already in place and are having a measurable impact. Through research such as described above, other management options, such as timed herbicide applications and timed grazing, can be built around agent activity to complement it and augment the degree of control.

TAKE HOME MESSAGES

- Biocontrol is a target specific, environmentally friendly means of reducing specific weed populations - it does not eradicate them over wide areas.
- Biocontrol and the Noxious Weeds Act are compatible
- Biocontrol is not a panacea - in most situations the only practical sustainable option is an integrated approach using biocontrol, herbicides, grazing management etc.
- To achieve a good integrated weed management strategy you need a good understanding of the weed's ecology.
- Integrated strategies involving biocontrol need to be designed around the agents - they cannot be added like a recipe, as they must be actively in place and that requires time.
- The final impact of agents can be maximised via integration and the time to achieve this can be sped up by effective redistribution.
- Landholder cooperation is essential to speed up the redistribution and hence time to impact of agents.
- Monitoring of spread and impact of biocontrol agents is as necessary a part of the process as distribution of the agents.

REFERENCES

- Allen, C.J. & Holst, P.J. (1996) Longevity of soil based seeds of *Onopordum illyricum*. *Plant Prot. Quart.* 11, 242.

Anon. (1984) *Biological Control Act 1984*. No.139 of 1984. Catalogue No 15668/84 5, Comm. Govt Printer, Canberra, 25pp.

Anon. (1993) *The Noxious Weeds Act, 1993*. NSW Govt Printer, Sydney

Anon. (1995) *Policy on use of biological control in response to a section 18 notice*. NSW Govt Printer Sydney.

Anon. (1997) *New South Wales Weeds Strategy: Coordinating the Fight*. NSW Agriculture, NSW Govt Printer Sydney.

Anon. (1997) *The National Weeds Strategy: A Strategic Approach to Weed Problems of National Significance*. ARMCANZ, ANZECC, Forestry Ministers, Comm. Govt. Printer, Canberra, 52 pp.

Briese, D.T. (1993) The contribution of plant biology and ecology to the biological control of weeds. *Proc. X Aust. & XIV Asian-Pac. Weed Conf.* Vol. 1, 10-18.

Briese, D.T. (1997) Biological control of St John's wort in Australia: Past, present and future. *Plant Prot. Quart.* 12, 73-80.

Briese, D.T. & McLaren, D.A. (1997) Community involvement in the distribution and evaluation of biological control agents: Landcare and similar groups in Australia. *Biocontr. News Inf.* 18, 37N-47N.

Bruzzese, E. & Lane M. (1996) *The blackberry management handbook*. Dept of Conservation and Natural Resources, East Melbourne, pp 1-50.

Chaboudez, P., Groves, R.H. & Burdon, J.J. (1993) *Puccinia cardui-pycnocephali*, a potential agent for the biological control of slender thistles in Australia. *Proc. 10th Aust. & 14th Asian-Pac. Weed Conf.*, Brisbane, pp 84-88.

Cullen, J.M. & Delfosse, E.S. (1985) *Echium plantagineum*: catalyst for conflict and change in Australia. *Proc. VI Int. Symp. Biol. Contr. Weeds*, pp 249-292.

Groves, R.H. (1996) The biology and control of certain compositae weeds from Mediterranean-type environments. *In Compositae: Biology and Utilisation. Proc. Int. Comp. Conf. Kew*, vol. 2, 321-331.

Julien, M.H. & Storrs, M.J. (1996). Integrating biological and herbicidal controls to manage salvinia in Kakadu National Park, northern Australia. *Proc. IX Int. Symp. Biol. Contr. Weeds*, pp 445-449.

Jupp, P.W. & Cullen, J.M. (1996) Expected and observed effects of the mite *Aculus hyperici* on St John's wort, *Hypericum perforatum*, in Australia. *Proc. IX Int. Symp. Biol. Contr. Weeds*, pp 365-370.

Pettit, W.J., Briese, D.T. & Walker, A. (1996). Aspects of thistle population dynamics with reference to *Onopordum*. *Plant Prot. Quart.* 11, 232-236.

Shea, K. (1996) Estimating the impact of control efforts: models of population dynamics. *Plant Prot. Quart.* 11, 263-265.

Sheppard, A.W., Aeschlimann, J-P, Sagliocco, J.-L. & Vitou, J. (1991) Natural enemies and population stability of the winter-annual *Carduus pycnocephalus* L. in Mediterranean Europe. *Acta Oecol.* 12, 707-726.

Sheppard, A.W., Cullen, J.M. & Aeschlimann, J-P. (1994) Predispersal seed predation in *Carduus nutans* L. (Asteraceae) populations in southern Europe. *Acta Oecol.* 15, 529-541.

Smyth, M.J. & Sheppard, A.W. (1996) The effect of simulated spray-grazing on the Paterson's curse crown weevil, *Mogulones larvatus* Schultze. *Proc. XI Aust. Weeds Conf.* pp 291-293.

Woodburn, T.L. (1993) Host specificity testing, release and establishment of *Urophora solstitialis* (L.) (Diptera: Tephritidae), a potential biological control agent for *Carduus nutans* L., in Australia. *Biocontr. Sci. Tech.* 3, 419-426.

Woodburn, T.L. (1996) Interspecific competition between *Rhinocyllus conicus* and *Urophora solstitialis*, two biocontrol agents released in Australia against *Carduus nutans*. *Proc. IX Int. Symp. Biol. Contr. Weeds*, pp 409-415.

Woodburn, T.L. & Cullen, J.M. (1995) Release and establishment of the thistle-head weevil, *Rhinocyllus conicus* in Australia. *Proc. VIII Int. Symp. Biol. Contr. Weeds*, pp 411-414.

APPENDIX: Primary contacts in CSIRO and NSW Agriculture for obtaining biological control agents

Contact	Address	Area covered	Weeds for which agents may be available
Barry Sampson	PMB Yanco 2703	Riverina, South and Central Western Slopes, Southern Tablelands and South Coast	Paterson's curse St John's wort Spear thistle
Paul Lutschini	PO Box 174 Mudgee 2850	Central Tablelands NSW	St John's wort Nodding thistle <i>Onopordum</i> thistles
Bob Smith	PO Box 1 Bingara 2404	New England, Western Slopes	Nodding thistle Paterson's curse
Paul Sullivan	PMB 994 Tamworth 2340	North Western Slopes, North Coast	Nodding thistle Paterson's curse Bitou bush
Anthony Swirepik	GPO Box 1700 Canberra 2601	Central and Southern Tablelands	<i>Onopordum</i> thistles



ALLIGATOR WEED

**IT CHOKES RIVERS
AND IRRIGATION
SYSTEMS AND
IS EXTREMELY
DIFFICULT TO
CONTROL**



PHOTO: ANDREW STORRIE

"CAN YOU IDENTIFY IT?"

**If you see any plant that looks like this contact
NSW Agriculture or your Local Council
*IMMEDIATELY***

CHANGING COMMUNITY ATTITUDES

Graham Matthews
Bellingen Shire Council

INTRODUCTION

I have been involved with the Bellingen Shire Council's Noxious Weed Control Program for a period of 18 years. I have not attained the position of Chief Noxious Plants Officer. During this time I have witnessed the arrival of many settlers to the Shire and noticed vast changes to both farming activities and noxious weed control methods.

HISTORY

Up until 1982 noxious weed control was relatively simple, main concerns being woody weed control such as lantana, blackberry, English broom and groundsel bush.

In 1992 Coffs Harbour City Council, Nambucca Shire Council and Bellingen Shire Council requested that Giant Parramatta Grass (*Sporopolus indicus* var. *major*) be declared a noxious weed.

Council and some landowners were then confronted with a new problem - as this was a pasture weed there were no simple control methods, thus forcing a greater reliance on agronomy. Agronomists Dick Latham from Coffs Harbour, and Max McMillan from Glen Innes had carried out some limited control work but there were still many unanswered questions.

In my capacity as Chief Noxious Plants Officer, I then proceeded to organise a public meeting in Bellingen to discuss Giant Parramatta Grass control measures. Invitations were extended to agronomists and chemical companies, as well as to Dr Surry Jacobs, Taxonomist, Royal Botanic Garden, Sydney; and Mr Harvey Baker, former Residue Chemist, Rydalmere Research Station, both leading experts in their fields.

Over three hundred people showed their concern by attending the meeting. The consensus of opinion at this meeting from the experts was that the most efficient and effective control method was the use of Frenock as part of an integrated pest management program, which includes pasture improvement. (A book of these proceedings has been published.) The main problem then, as is now, is the withholding period of Frenock.

A search was then mounted to attempt to find a suitable alternative for a mechanical/physical/quarantine control method which could be implemented by both Councils and landowners.

LOBBY GROUPS

Pressure was being applied through landowner groups to the Department of Agriculture and the Government. The Minister agreed to appoint two agronomists each spending 50% of their time of Giant Parramatta Grass research - Dr Peter Mears and Mr Terry Launders. Council then conducted a series of public meetings, field days, trials, and a committee was formed.

ENVIRONMENTAL GROUPS

Environmental groups began to emerge and to lobby. In the Bellingen Shire groups such as the Toxin Action Group (TAG), Kalang Environment Group (KEG), and the Bellingen Environment Centre (BEC) started to apply pressure on Council, requesting detailed information on toxicity of the chemicals, advertising of spray operations and information on environmental and health aspects of the chemicals used.

Council responded by obtaining all available information from the National Registration Authority and other bodies and notified all landowners of spray operations through the local radio station 2BBB. The announcements were to be made the morning of spraying, advising the location of spraying, the chemical used and the withholding period. When environmental groups requested additional information on the chemicals used, a copy of every label and material safety data sheets (MSDS) were supplied to the local radio station to broadcast any information that they saw as relevant.

ADVERTISING PROBLEMS

Early in the morning when the decision was made where and when to carry out the control spray program, I would telephone the radio station and talk to the operator. If she/he were on air, I would leave a message on the answering service. After I had been accused of not leaving messages on the answering service, it was resolved that faxes be sent to the radio station; I was also accused of not sending the faxes. Now faxes are transmitted and recorded by an independent person.

PRESSURE

Additional pressure was also being applied by farmer groups through the media and local members. The NSW Noxious Plants Advisory Committee allocated a grant of \$50,000 to Giant Parramatta Grass research.

Agronomists on the North Coast were galvanised into action and conducted meetings, field days and trials, advertised extensively on radio, in the newspapers, on TV and printed brochures and posters. Additional money provided by local councils and private enterprise was spent on research and a committee was formed. This committee still exists today and is known as the NSW Northeast Noxious Weeds Advisory Committee.

MORE PRESSURE

Environmental groups began to apply additional pressure on Council. Council responded by inviting members of the NSW Noxious Weeds Advisory Committee to hold meetings with both Council and environmental groups in the Bellingen area. Mr Roger Toffolin, Registrar of Pesticides was also invited to attend a meeting with Council and environmental groups.

EVEN MORE PRESSURE

As pressure was now also being applied by farmer groups through the usual channels, it was decided that Mr Terry Launder, Agronomist, Taree be put in charge of the Giant Parramatta Grass Program and Council conducted meetings, trials and field days, etc.

PRESSURE FROM ALL ANGLES

The Giant Parramatta Grass issue, along with the withholding period of Frenock and the search for alternate control methods was becoming a powder keg on the North Coast. It was decided that a delegation of noxious weeds inspectors hold discussions with Mr Doug Hocking and Mr John Fisher from the Department of Agriculture at the 1995 Eighth Biennial Conference at Goulburn.

It was not until it was brought to the attention of Mr Hocking and Mr Fisher that environmental groups had combined and threatened an injunction to stop the use of herbicides, particularly Frenock in noxious weed control in the Kalang valley, that action commenced in the form of an injunction. The legislation being used to push for the injunction was the NSW Clean Waters Act.

ACTION

Mr Doug Hocking and Mr John Fisher met with Council and environmental groups. The statement causing most concern was made by Mr John Fisher who said that Council would require a licence under the Clean Waters Act before they could use herbicides in the Kalang valley.

NEW AGRONOMIST

The Department of Agriculture then appointed another agronomist, Mr Andrew Storrie from Tamworth to work on the problem. Following several meetings, a committee was formed, conducted trials and then formed a sub-committee. This sub-committee is overseeing a roadside management plan that is, at present, being prepared to be submitted to Council.

NEW ADVERTISING PROCEDURES

Council has now adopted a new advertising procedure and issues the following brochure:

“BELLINGEN SHIRE COUNCIL

NOXIOUS WEEDS ACT, 1993

The objects of the Noxious Weeds Act, 1993 are as follows:

- *To identify weeds in respect of which particular control measures need to be taken;*
- *To specify those control measures;*
- *To specify the duties of public and private landholders as to the control of those noxious weeds; and*
- *To provide a framework for the Statewide control of those noxious weeds by the Minister and local control authorities.*

Unlike the Act that it replaced, the Noxious Weeds Act has control categories that apply to each noxious weed. The categories are W1, W2, W3 and W4, with W1 being referred to as a ‘notifiable weed’.

The action required to be taken under the Act to control a noxious weed for which a particular control category is specified is set hereunder:

- *For a W1 noxious weed, the presence of the weed on land must be notified to the local control authority and the weed must be fully and continuously suppressed and destroyed;*
- *For a W2 noxious weed, the weed must be fully and continuously suppressed and destroyed;*
- *For a W3 noxious weed, the weed must be prevented from spreading and its numbers and distribution reduced; and*
- *For a W4 noxious weed, the action specified in the declaration must be taken in respect of the weed.*

The Act stipulates that occupiers (or owners) of land have responsibility for controlling noxious weeds on their land whilst Councils are responsible for controlling noxious weeds on their Public Roads.

Councils traditionally have controlled noxious weeds with herbicides because that was considered to be the most cost effective way to solve the problem.

In recent years, there has been increasing expressions of community concern about the use of herbicides and Bellingen Shire Council, with the assistance of its Noxious Weeds Advisory Committee, has been reviewing Council's roadside spraying policies and practices. This brochure sets out some of the current policies for your information and assistance.

Notification of Noxious Weeds Spraying

The Council acknowledges that many of its residents are opposed to Council's practise of using herbicides on road reserves and is now actively encouraging these residents to control noxious weeds on the road reserve using alternative methods.

Council has adopted a policy which, put simply, requires it to advertise its intention to spray herbicides along a public road for a two week period prior to the proposed operations.

As well as the advertisements, Council erects signs which are red on white, which indicate the date the road is to be sprayed, the chemical proposed to be used and the withholding period.

this notification process provides adjoining property owners with an opportunity to let the Council know that they are prepared to control noxious plants without using herbicides.

Once Council is notified, a sign (black on white) is supplied for erection adjacent to the property and it is then the property owner's responsibility to control the weeds within two months. Failure to do so will lead to Council taking action without further notification.

Liability of Land Owner/Occupier

If the property owner or occupier notifies Council of their intention to control noxious plants on the road reserve, the following requirements apply:

- a) *Purchase that number of signs from Council which you require for your road frontage(s), i.e., each end of each property. The signs cost \$5.00 each.*

- b) Erect the signs as in (a) on your property fence(s), or in a visible location clear of the roadway and table drain, and maintain these signs during the advertised period plus two (2) months.*
- c) After advertised period and as in (b) above, remove the signs and store for future use.*
- d) Suppress and destroy the noxious weeds on those road frontages, particularly during the advertising period. Should you have any doubts, please contact Council's Noxious Plants Officer, Mr Graham Matthews.*

Roadside Management Plan

Council is striving to attain Best Practice in all its operations and weed control is no exception. Council is committed to a Roadside Management Plan utilising integrated methods of controlling noxious weeds and unwanted vegetation whilst optimising the value of roadsides throughout the Shire.

The Council is currently seeking funding to employ a coordinator to prepare the Bellingen Shire Roadside Management Plan and it is anticipated that it will take some months to complete."

Many problems still exist:

- Weather conditions;
- Machinery breakdowns;
- Advertising required on roads when there is minimal work to be done;
- People stealing signs;
- Signs being erected on land people do not own;
- Insurance problems, etc.

ENVIRONMENTAL PROTECTION AUTHORITY (EPA)

The Environmental Protection Agency held meetings with the representatives from both Council and environmental groups. It was decided to carry out chemical trials on roadsides using worse case scenario conditions to monitor herbicide movement.

PRESENT POSITION

The EPA results have been released but not at a press conference as originally promised. This has allowed environmental groups to lobby the media with their own interpretation of the results, which may be misleading. Council has received a letter from Legal Aid on behalf of environmental groups stating that they have instructions to proceed with legal proceedings if Council breaches the Clean Waters Act.

Council resolved not to carry out any work on vacant Crown land.

Council has resolved to adopt a twelve-point plan as follows:

- 1. "That Council recognises its responsibilities under the Noxious Weeds Act.*
- 2. That Council acknowledges that there is concern regarding the use of herbicides within the community.*

3. *That Council gives an undertaking to reduce the use of herbicides within its weeds management program and to introduce integrated management.*
4. *That the Weedbug Wickwiper be trialed in the valley on Waterfall Way.*
5. *That discussions be held with the Department of Agriculture regarding the future of roadside weed management.*
6. *That Council states that it supports the Roadside Management Plan and gives an undertaking to ensure its implementation.*
7. *That Council investigates the use of dyes to indicate the areas sprayed and bring a report to Council.*
8. *That Council cease roadside spraying in the Bellingen Valley until the Roadside Management Plan is in place and until the EPA provides Council with regulations for spraying near waterways.*
9. *That herbicide usage be permitted in the urban areas only by means of a hand-held ropewick applicator.*
10. *That Certified Organic Farmers be invited to register their location with Council.*
11. *That Council request the Department of Agriculture to give advice on acceptable levels of control of Parramatta Grass on roadside verges.*
12. *That the General Manager bring a report to Council on the possibility of contracting out Noxious Weeds Control within the Shire."*

Newspaper articles and letters to the editor have almost dominated newspapers in this area for years.

TAKE HOME MESSAGES

If there are any health risks or contamination risks to produce or the environment, we, as weed inspectors need to know. If there are no risks, Council needs assistance from relevant authorities to be able to carry out efficient and effective control methods under all relevant legislation.

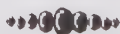
The Department of Agriculture has to take its responsibility under the Noxious Weeds Act seriously and remember what the word "agriculture" means.

The EPA has to solve the problems with the Clean Waters Act and come up with workable guidelines based on scientific facts not political???

Every inspector is required to carry out noxious weed control in his/her area to the best of his/her ability and help eliminate the spread to other areas. Councils sometimes do need assistance, guidance and leadership, not just another agronomist.

We already have the best agronomist in NSW - his name is John Betts.

Noxious Weed Inspectors must drink plenty of red wine because it is going to be a tough couple of years.



DOW ELANCO PRODUCT UPDATE

Chris Love
Product Development Manager
Dow Elanco
Kenmore, Qld

LABEL UPDATE: GARLON 600 HERBICIDE (600 G/L TRICLOPYR)

- New label to be registered late 1998.
- Formulation change allows improved packaging options and further reduces volatility of formulated product.
- Will be identified by "Easy Pour" 20L HDPE jerrycan.
- Formulation has been commercially sold in NZ with equivalent bioequivalency.
- New easy-to-read Woody Weed Label.
- Updated general instructions section (description of application methods).
- Woody weeds #:
 - * Basal Bark (fencelines and fire trails) (NSW only) at 1:60
 - broadleaf hopbush
 - narrowleaf hopbush
 - turpentine bush
- Cropping #:
 - Compatibility with Roundup CT
 - Addition of crop sorghum

LABEL UPDATE: STARANE 200 HERBICIDE (200 G/L FLUROXYPYR)

- | | |
|---|-----------------------------------|
| • High volume application # | mL/100L |
| – Bathurst burr/Noogoora burr | 75 |
| – Climbing buckwheat | 300 |
| – Common sensitive plant (plus Uptake Spraying Oil) | 333 |
| – Blackberry nightshade/Bokhara clover/Caltrop/
Docks/Flannel weed/Hexham scent/Honey locust/
Small flowered mallow/Yellow flowered devil's claw/
Cockspur thorn | 500 |
| – Mother-of-millions | 600 |
| – Prickly acacia/Snakeweed | 750 |
| – Common sowthistle/Tree violet | 1000 |
| – Wandering jew | 1500 |
| • Basal bark & cut stump # | 100L diesel |
| – Chinee apple | 3.0L |
| – Honey locust - up to 10 cm | 1.5L |
| - up to 20 cm | 3.0L |
| - > 20 cm & CS | 5.0L |
| – Sisal hemp | 3.0L (bb) or 10mL neat/stump (cs) |
| – Chinese celtis | 3.5 L (bb only) |
| – Cockspur thorn | 1.5L (bb only) |

Established grass pastures # (NSW only)

- Silverleaf nightshade
 - 0.75 L/ha + uptake or
 - 375 mL + 1.2 L 2,4-D amine + uptake
- St John's Wort 3 L/ha

HERBICIDE UPDATE: GRAZON DS HERBICIDE

(100 g/L picloram + 300 g/L triclopyr)

Grazon DS Herbicide (1995 Update - Southern Areas)

• Weeds Controlled	Rate mL/100L water
– Docks	350-500
– Galenia	500 or (5 L/ha)
– Manuka	500 (Vic only)
– Ragwort	350-500
– St John's Wort	500
– Thistles	350-500

Grazon DS Herbicide (Proposed 1998 Update #)

- Lantana: 350 mL rate
 - * addition of adjuvant
 - Update Spraying Oil
 - Pulse Penetrant
- Compatibility with metsulfuron
 - bracken fern in association with blackberry

• Weeds controlled	Rate/100L
– Mother-of millions	500 mL
– Blue heliotrope	500 mL
– Horehound	350 mL
– Japanese Sunflower	500 mL

PRODUCT UPDATE: ACCESS HERBICIDE

(120 g/L picloram ester + 240 g/L triclopyr ester)

- Specialised product
 - basal bark and cut stump application
 - mixes with diesel only
 - one use rate (1:60)
 - use all year round
 - controls a wide range of species

Southern Areas

- | | |
|------------------------------|--------------------------|
| * Angophora regrowth | * Hawthorn |
| * Australian blackthorn | * Lantana |
| * Brush and swamp box | * Red ash (White myrtle) |
| * Camphor laurel | * Sweet briar |
| * <i>Eucalyptus</i> regrowth | * Teatree |
| * <i>Grevillia</i> spp. | * Tree of heaven |
| * Groundsel bush | * Tree pear |
| * Guava | * Wattle regrowth |

Western Areas

- | | |
|----------------------------|-------------------|
| * Algaroba (Mesquite) | * Prickly acacia |
| * Ellangowan poison bush | * Punty bush |
| * False sandalwood (Budda) | * Rubber vine |
| * Heartleaf poison bush | * Turpentine |
| * Narrow leaf hop bush | * Turpentine bush |
| * Needlewood | * Wilga |
| * Parkinsonia | |

3 CYCLE PLAN

Access Herbicide can be an integral component of a programmed approach to woody weed control. Remember to use a 3 Cycle Plan for optimum woody weed control.

SUMMARY

- Proposed label updates:
 - Garlon 600
 - Starane 200
 - Grazon DS
- Registration by end 1998
- Future Development Work
 - Watch this space!



MACSPRED PTY LTD - NEW PRODUCTS

Kel Stokes & Geoff Keech
MacspreD Pty Ltd

WHAT IS MACSPRED?

MacspreD is a small privately owned company, specialising in the manufacture and supply of a range of specialist herbicides and delivery systems for the forestry and industrial weed control market.

Originating in 1985, MacspreD originally had a products arm, founded by Stan McFadzean, who left DuPont to pursue his dream of the development of granular herbicides, and a marketing arm run by Ray Nightingale.

MacspreD Infrastructure

In 1990 MacspreD as we know it today expanded to national distribution with offices in Victoria, New South Wales and Queensland with appointed distributors in Tasmania, South Australia and Western Australia. Each Eastern sales office has a business manager, sales supervisor, administrative support staff and its own warehouse facility.

1996 saw the opening of a new manufacturing and head office facility in Ballarat, which allows us to formulate all of our granular products "in house".

MacspreD Focus

The development, manufacture and sales of granular herbicides remains our core business, which is strongly supported by a complete range of forestry and industrial herbicides from manufacturers such as DuPont, Dow Elanco, Monsanto, CropCare and Nufarm and other prominent research and development based companies.

In support of our granular product range, it has been necessary to develop specialised product delivery systems as well as adapt some overseas technology. Accurate metering and placement of herbicides is a need common to granules as well as liquid based compounds.

Specialised on track rail systems, linkage forestry units and motorised back pack equipment is complemented by hand operated broadcast and spot treatment machinery. All of these units are setting the standard for safe and cost effective herbicide application.

MacspreD Field Operations

MacspreD has a unique commitment to in field service and technical backup for our entire product range. We offer competitive but not necessarily the cheapest pricing which is still backed up by our guarantee of service.

As part of our in field service, we carry out trial work with our customers to evaluate new and existing products to match their particular needs.

Why Granular Herbicides?

Granular herbicides are manufactured to be applied directly to the soil without the need to mix with water. They should not be confused with the wettable dispersible granules such as the newer formulations of atrazine and simazine, or the Dry Flowable technology of Brush-Off, Oust DF or Roundup Dry.

Many of you are familiar with granules and the reasons why people are switching to this concept. The following list nominates some of the reasons.

- Reduced environmental impact - fewer and more readily disposed of containers.
- Reduced cost of application - same area covered in as little as 25% of the time required for liquids.
- Improved operational efficiency - no need to cart water, larger application window.
- Improved user safety - no splashing, fumes or fine droplets, not a dangerous goods.
- Improved public relations - no booms or bad odours.
- Improved residual performance - no foliar tie up of the active.
- Low toxicity rating - no solvents, no volatilisation.
- Low drift hazard - no small droplets, minimal wind effect on granules.

Research and Development

As part of our ongoing pursuit of excellence in meeting the demands of the industry we service, Macspred conducts research into new compounds and combinations of existing compounds to cover the complex needs of our customers. It was from this research that the Eucmix TMGR granular herbicide was discovered some 5 years ago.

In 1992 Macspred began trial work to evaluate 30 different herbicide combinations for weed control in Eucalypt plantations. From this 2 year initial screening work emerged a product which demonstrated early post emergent and residual control of herbaceous weeds in one year old Eucalypts.

Eucmix TMGR contains an active ingredient combination of Terbacil and Sulfometuron Methyl. Macspred applied for registration in October 1996 and all indications are that the product will be finally registered and available for use in 1998.

Initially registration will be for use in *Eucalyptus nitens*, *E. regnans* and *E. globulus*. The future may hold value for many other species and situations such as amenity horticulture, Landcare plantings and farm forestry woodlots.

Development Trials

Macspred and various researchers around Australia have conducted a series of further trials. The results to date have shown excellent weed control, knockdown and tree tolerance. Weed control was still evident 12 months after treatment. It should be noted that liquid formulations caused severe phytotoxicity to the trees. At the end of the second year of the trials the trees are measured. The Euc MixTMGR treated trees showed significant increases in wood production over the untreated control.

In more recent trials in 1996 where Eucmix TMGR has been tested over the top of young Eucalypt seedlings, that is 2-4 months after planting, it was found that the following criteria must be followed to obtain consistent results.

1. Excellent soil moisture at the time of application.
2. Good follow-up rainfall to incorporate the product.
3. Susceptible weed spectrum.
4. Weed growth less than 10cm in height and diameter.

Weed Control Performance

Weeds controlled (as listed on the label):

Fog grass	<i>Holocus lalatus</i>
Capeweed	<i>Acrtotheca calendula</i>
Annual ryegrass	<i>Lolium rigidum</i>
White clover	<i>Trifolium repens</i>

Weeds suppressed:

Sorrel	<i>Rumex acetosella</i>
Flatweed	<i>Hypochoeris radicata</i>
Sweet vernal	<i>Anthoxanthum odoratum</i>

Weeds not known to be controlled:

Paspalum, Woody Weeds including blackberry, bracken, acacia species, perennial phalaris, radiata pine*, spear thistle*.

* Although not controlled, severe phytotoxicity can be caused.

N.B. Eucmix TMGR may be active on other weed species which have not been present in trials to date.

VISUAL EXPECTATIONS

Eucmix TMGR Granules

- Slower than liquid sprays.
- 6 - 8 weeks 'brown out' given moderate rainfall.
- Less residual in sandy soils.
- 6 - 9 months residual activity demonstrated in trials, depending on soil type and climatic variables.

Application and Application Equipment

Eucmix TMGR can be used for spot, mound (strip) or broadcast application to control weed competition.

Broadcast and mound application methods, where possible, provide the best growing conditions for eucalypts by reducing the weed competition for soil moisture and nutrients. Application can be carried out using purpose designed Macspred tractor mounted or motorised back pack granular herbicide application units.

Accurate spot application is possible using a hand held Weed-a-metre unit designed to distribute a measured dose of granules over a 1 metre diameter spot. This can be applied at 1 metre spacings around a tree (i.e., 4 spots) to provide an approximate 2 X 2 metre area of weed control.

SUMMARY

Macspred's Eucmix™GR when registered will offer Eucalypt plantation managers a new (and needed) post planting weed control option.

Eucmix™GR will be registered only for the three species mentioned previously, with further screening for selectivity required before other species can be added to the label.



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ROADSIDE VEGETATION MANAGEMENT - THE NSW ROADSIDE ENVIRONMENT COMMITTEE - THE PICTURE SO FAR

Carolyn Woods
Executive Officer
NSW Roadside Environment Committee, Sydney

This paper outlines a brief history of the NSW Roadside Environment Committee (NSW REC), why roadside conservation is important and the three step procedure which guides better roadside management. It will discuss the importance of an integrated and planned approach to weed control that will enable more effective use of time, money and resources for the long-term management of the roadside environment.

BACKGROUND

The NSW REC was formed in June 1994 and is a group of people and organisations working with the road and rail authorities, that is the Roads and Traffic Authority (RTA), Local Government, Rail Access Corporation (RAC), Rural Lands Protection Board (RLPB) and State Rail Authority (SRA), and the community to encourage the better management of NSW roadsides and linear reserves. This group of fourteen is funded by the NSW RTA and the Department of Local Government (refer Appendix 1). Additional to these direct contributions, representatives on the Committee have committed time and effort to our Mission of "facilitating the management of roadsides for the benefit of the environment and the people of NSW. The NSW REC undertakes this role through the work of the Executive Officer who is guided by the goals and objectives set by the Committee.

The Committee has developed a range of publications to assist in roadside management planning including a roadside video, handbook on best practice for construction and maintenance workers, information sheets and a series of booklets to assist in developing and implementing management plans.

Roadside managers have responded well to the efforts of the Committee so far. Over thirty Local Councils are actively working toward improved roadside management. There are also 7 Rural Lands Protection Boards (RLPB's) in central NSW who have assessed the natural resources on their stock routes and reserves, and have developed guidelines for their management.

WHY CONSERVE ROADSIDE NATIVE VEGETATION ?

Weed invasion, vegetation clearing, land degradation including soil structure decline, erosion, acid soils, dryland salinity and increased soil nutrients; grazing, inappropriate road construction and maintenance and other influences have effected the health and extent of native vegetation across the State.

Roadsides and Travelling Stock routes make up five percent of the area of the state, which is equivalent to the area of national parks and nature reserves. In many localities in NSW, the roadside environment is the only place where native bushland remains. The West Hume landcare group, in the southern part of the State, estimates that while only three per cent of original native vegetation remains in the area, 60 per cent of it survives along the roadside.

Apart from the benefits of retaining roadside vegetation as habitat for plants and animals there are a number of important benefits. These benefits include helping to prevent soil erosion and other land degradation problems. There are a number of other social and economic features within roadsides including cultural heritage landmarks such as bridges and Aboriginal scar trees. Grazing for travelling stock, particularly during times of drought; providing fire fighters with strategic space for bushfire control and opportunities for public utilities such as electricity, gas and telecommunications equipment are important economic uses.

The original native trees, shrubs, grasses and other groundcovers provide other values because they:

- are easier and cheaper to maintain than introduced vegetation as native plants are adapted to the local physical environment;
- often contain rare and endangered plants and animals;
- are a vital source of local seed for replanting; and
- provide a valuable recreational resource for travellers by providing shade and contributing to the enjoyment of views within the landscape.

NSW's APPROACH TO ROADSIDE MANAGEMENT

Remnant vegetation management is all about minimising disturbance. Disturbing the soil and healthy native vegetation;

- encourages weeds, which compete with native plants and increase maintenance costs and fire-risk of roadsides;
- can prevent the natural regeneration of native plants; and
- increases the risk of soil erosion.

It is cheaper and easier for the land manager to protect existing trees, shrubs and groundcovers than it is to replant them or follow-up with maintenance. In a lot of natural areas soil and vegetation conditions have been modified by factors such as poor agricultural practices, vegetation clearing, pollution or population pressures. In many areas where soil disturbance has occurred and native vegetation has been replaced by introduced annual and perennial grasses, fire risk has become a problem during summer. Native perennial grasses, actively grow during summer and are less fire prone and provide green pick for stock during drought. Remnant roadside vegetation management, in particular, relies on appropriate decision making and planning for the local environment. This includes an integration and commitment of substantial human, machinery and financial resources over a period of time to find solutions to issues and problems facing the maintenance of these areas.

Dumaresq Shire, in the northern tablelands, has worked with a number of other local government areas to form a noxious weed County Council. This coordinated weed control over a relatively large area has created the conditions for improved planning, resource use and implementation of programs. Apart from belonging to the Noxious Weeds County Council Dumaresq and Uralla Council have both undertaken a shire-wide roadside assessment, developed roadside management plans and undertaken training in best environmental practise for roadside and construction workers.

Noxious and environmental weeds are a significant issue in terms of roadside management. Linear reserves have a large boundary to area ratio which means native vegetation is prone to

disturbance which can lead to weed invasion. Weed infestation along roadsides and linear reserves need to be identified for appropriate planning, and coordination of their control.

In response to the need for better roadside management the NSW REC has developed a three step process for tackling roadside and linear reserve vegetation management. The steps identified in the approach developed in NSW for roadsides, which covers managing existing natural areas, are broadly outlined below. These principles can be extended to weed control.

The Committee has developed a three stage process which includes assessment, planning and implementation.

1. ASSESSMENT

In order to determine baseline information on the various features of the roadside environment, Local Government, RLPB, landcare and other community groups should be involved in assessment of features including road width, condition of vegetation, introduced species, regeneration and other issues relating to the 'health' of the roadside.

This roadside assessment guides the collection of information over vast lengths of road. Vegetation communities can easily be distinguished using this method. Information collected on the relative condition of the vegetation allows roadsides to be placed in broad management categories.

The primary issues that need to be addressed for environmental management for roadside projects are:-

- Protection of good quality remnant vegetation
- Determining the grazing potential of roadsides
- Identifying areas where soil has been degraded
- Identifying priority areas for road development and location of utilities
- Identifying the potential for tourist road development
- Identifying areas for revegetation and corridor enhancement

Undertaking a roadside assessment identifies the extent of weed infestation and the pattern of weed distribution. One management tool developed through the Western Australian Roadside Environment Committee have developed shire maps, where roadside assessments have been carried out, which indicate the extent and severity of weed infestation along the roadsides. Maps are also produced for the roadside management categories and overlayed with vegetation coverage for the shire. These maps are a valuable tool for weeds officers who can identify where priority weed control should take place.

It is important that the assessment process is consistent so that there is no discrepancies in the management of roadsides across a Shire. With the move toward total catchment management the NSW RECs standardised approach to assessment can provide baseline information that is consistent for roads that cross Shire boundaries.

2. PLANNING

An important step in managing the roadside environment is the development of a plan. The collection of existing material, including topography, soils, heritage sites, land use maps and

others, will provide important additional information. After the identification of the three roadside management categories which are;

- High Conservation Value - defines areas in a relatively natural, undisturbed state. They are usually fairly stable environments, requiring low management input and therefore, costing less to maintain.
- Medium Conservation Value - defines areas which would most benefit from active management. Defined management goals will assist in determining the range of activities to be undertaken at these sites. Rehabilitation and stabilisation in these areas may be possible. Other uses may be possible, where rehabilitation is incompatible.
- Low Conservation Value - are the most modified or degraded roadsides. There is often a high prevalence of weeds or other exotic vegetation and may also be subject to erosion or be a high fire risk.

It is important to have broad definitions for the roadside management categories. These can be descriptive or issues-based, depending on the objectives of the plan. It is important to clarify what the general attributes are for these categories. Sites also need to be identified which require specific management prescriptions. For example sites which contain rare or threatened species, active gully erosion, cultural planting of trees or Aboriginal heritage items. Undertaking community consultation will identify issues and possible management solutions to be included in the roadside plan.

It is important for the RTA, Local Government, RLPB, RAC, and SRA to balance land use appropriate for the management category, taking into consideration the social, economic and environmental factors identified through consultation.

The establishment of policies and management guidelines can establish a consistent management approach to an issue. With the establishment and implementation of a policy there needs to be widespread knowledge and demand for the policy from the local community. Combining management guidelines with policies, legislative powers and a public awareness campaign will assist in the successful adoption of better roadside management. Dumaresq Shire in the northern tablelands of NSW has developed a policy which regulates the collection of firewood from road reserves and the RLPB has also adopted the same policy for its stock reserves in the area.

A plan which is prepared without community agreement and not in cooperation with stakeholders and other interested organisations is a waste of time and resources.

3. IMPLEMENTATION

How do we implement the plan and make the changes required for better roadside management ? Implementation of the plan and the introduction of effective and coordinated environmental roadside management requires a broad range of initiatives to be undertaken by the roadside manager and linear reserve . The development and use of best practice methods and management guidelines, particularly for contractors, establishing environmental roadside policy and implementation of the management plan can ensure appropriate on-ground management. It is critical for effective on-ground management that these four broad ways of implementation are undertaken and these are;

a) Training

Training can complement the objectives of the plan, and create an understanding of the plan for all staff. Training for the control of noxious weeds should include ecological principles, planning, revegetation and vegetation management. This information can empower staff to make informed decisions in regard to effective weed control but also vegetation management. Best practice improves the skill and effectiveness of the operator which in-turn saves money and time for the weed control program. Training in the objectives of the plan should be provided to all staff of the RLPB, Local Government, SRA, RAC, and the RTA.

b) Public Education and Awareness-Raising

It is important the community is aware of the value of roadsides, what their responsibilities are and what else they can do to ensure a change in the use of roadsides. Raising awareness through the media, signs, rate notices and informing local community groups can encourage involvement in roadside management. Dubbo, located on the Western Plains of NSW, has developed an adopt-a-road program where local business and the community are maintaining and replanting sections of the Newell Highway.

c) Regulation

This is a complementary method to the above which can be used to ensure compliance with environmental policies and federal and state legislation. The community should be suitably informed before any fines or legal action is undertaken under new environmental legislation. To reinforce the intentions of your organisation, any infringement can be reported publicly.

d) Follow-up

Plans need to be regularly reviewed every one to two years so they remain relevant. A review will ensure any plan remains flexible and workable. Someone specifically needs to be responsible for the plan to ensure its progress and to maintain momentum.

IN SUMMARY

Roadside environmental management requires the cooperation of all roadside managers, stakeholders, interested organisations and the community to ensure the effective management of the roadsides. Weed control is one issue in roadside and linear reserve management which needs to be carried out in consultation with other roadside managers, stakeholders and the community. Appropriate planning and good knowledge and awareness of the roadside and linear reserve environment, by everyone involved in its maintenance, and training of personnel involved in its management can only benefit this environment, particularly through effective and coordinated weed control.

APPENDIX 1

Representing the interests of roadside management are:

Roads and Traffic Authority - Policy
Roads and Traffic Authority - Environment
Institute of Municipal Engineers
Electricity Association of NSW
Rail Access Corporation
Nature Conservation Council
Rural Lands Protection Board

Local Government & Shires Association
National Parks and Wildlife Service
Department of Land & Water Conservation
Department of Urban Affairs and Planning
Department of Bushfire Services
Greening Australia, and
Department of Agriculture





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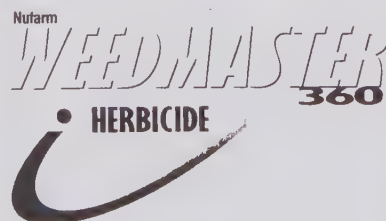
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PO BOX 1594 GRIFFITH 2680

Nufarm introduces Weedmaster 360 for safer weed management all round

Glyphosate herbicide has been used in Australia since the mid 1970's for the control of annual, perennial, brush and woody weeds, and unwanted trees in a wide range of situations.

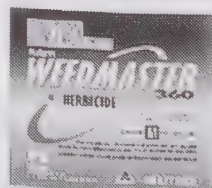
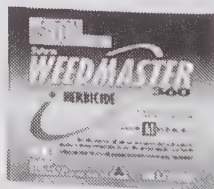
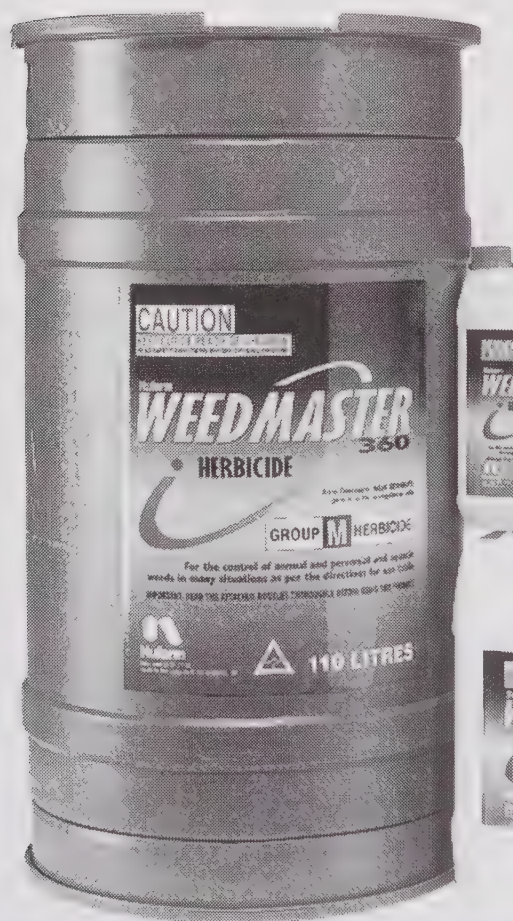
Now Nufarm introduces Weedmaster 360 Herbicide, a glyphosate formulation with

built-in surfactant that's environmentally safe, even near waterways.

When unwanted vegetation needs to be controlled where water may pond or flow, it's reassuring to know that Weedmaster 360 Herbicide is approved for use in wetlands, streams, lakes, dams, channels and drains.

The benefits of Weedmaster 360 Herbicide from Nufarm

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Dubbo: Nick Moses 014 033 841	Cowra: Tim Perkins 018 637 310
State Office (Dubbo): Chris Ryan (02) 6884 8180	



USING THE MEDIA TO ADVANTAGE

Robyn Yeo
NSW Agriculture
Dubbo

INTRODUCTION

The word "media" conjures up a range of different thoughts, feelings, and attitudes in different people.

Some may say it's negative, invasive, sensationalist.

Others have a more positive view - it's helpful, thought provoking, informative.

Some say it sets the agenda for public opinion.

Others believe it reflects public opinion.

Whatever your view, there is no denying the media plays a huge role in the lives of people the world over.

Therefore it follows that if this force can be harnessed in the right way, the media can provide a useful tool for those in the community who want to get a message across and influence the way people think.

And that means media can and should play an important role in your work, in promoting effective weed management into the 21st century.

MEDIA TYPES

Media, as we know it, refers to print media like newspapers, magazines, and journals; as well as electronic media like radio and television, and increasingly, information technology or the Internet.

Each media type works differently.

Newspapers, in regional New South Wales can be printed weekly in the smaller centres like Coonamble, or daily in regional cities like Dubbo and Tamworth.

This in itself means a huge variation in deadlines which must be taken into account when planning a media campaign.

Radio, of course, is the most immediate news and information delivery service. What makes news one minute, can literally be on the news the very next. It's essentially a morning service.

Television on the other hand, tends to be the focus for night time news, although many are now turning on the box for morning info-tainment programs like Channel 9's Today.

PLANNING A MEDIA CAMPAIGN

All types of media should be used in any planned media campaign, and their different requirements must be taken into consideration in the planning process.

As an example, if we are attempting to get a message to landholders about any problem weed, say Silverleaf Nightshade, the campaign could include:

- Community Service Announcements/ads on radio and television over a two week period when the weed can easily be identified in the paddock
- A general News Release about the weed, how it grows, what harm it can do, and how to identify it
- Interviews with radio stations, particularly ABC Rural Reporters, regarding the weed
- A television news story on regional stations.

This may sound like a daunting task but it can be made simple by selling the message in the right way. If we focus on the potential damage the weed can do, and spell this out in monetry terms for example, it's far more likely to get a run than if we were simply to describe the weed.

A positive approach through the campaign can also be helpful. For example, the promotional material could include a message from Farmer X who has lifted his production through appropriate weed management techniques.

I believe it's always useful to remember that a farmer may be sceptical about the advice of a public servant or council official, but when the words are coming from an industry colleague, i.e. another farmer, the message is more likely to achieve a positive response.

PROFESSIONAL ADVICE

Wherever possible, I would advise you to make use of professional media services to assist in the development of media campaigns. I know some councils have their own PR/media staff, and NSW Agriculture Weeds Officers throughout the State have access to six Regional Media Officers based on the North Coast, Tamworth, Maitland, Camden, Wagga, and Dubbo. By liaising with the Department Weeds Officers, it would be quite possible to obtain the help of these Media Officers.

I recognise that not everyone will have access to professional media staff and there may not always be time to find a person who can help.

DEVELOPING LINKS WITH LOCAL MEDIA

For this reason, and to help increase awareness of your organisation throughout the community, I strongly urge you to develop links with the media organisations servicing your region.

By developing this rapport, not only is it possible to get your news message across to your target audience, but it's likely the very same media groups will start to see you as an authority on the subject and seek your comment when relevant issues arise in a general news sense.

By establishing and maintaining this good relationship with the media, you will find yourself in a good position to not only sell your message, but respond in a positive way to any negative publicity which may arise in your region. For example, a local landholder complains that the Council Weeds Officers are not enforcing the law because the boxthorn on the neighbouring property has been running rampant for 20 years. Instead of approaching the Council itself, he calls the local paper which runs a front page story with accompanying photographs.

I would expect the paper to follow this story through by giving the Council a right of reply. Where the relationship with the media is already well established, this should prove a relatively simple action.

" That Weeds Officer who's always so generous with information can probably comment. " Ring him says the Editor.

The resulting headline may read " Council Acts Promptly to Control Weed Problem".

If there is no rapport or no known media contact on weeds, and Council officers appear to be avoiding the issue, the resulting story could prove very lop-sided in favour of the complainant - " Council Ducks for Cover Over Weeds Fiasco".

A good relationship with the media doesn't buy you protection from bad publicity... but it can help.

And the more confident you become in dealing with the media, the more likely you will be able to direct the right response when the going gets tough.

Make a point of meeting local journalists face to face. Establish contact and leave your name, position title, and telephone number with them. It can certainly pay dividends.

Of course dealing with media in a regional setting is quite different from handling city-based media. However I feel in the context of this conference, it would serve little purpose to focus on the city media, when clearly the most pressing need for noxious weed promotion is throughout regional New South Wales.

TAKE HOME MESSAGE

1. Print and electronic media can be used in a positive way to get important noxious weeds messages across to a target group.
2. The special needs and attributes of each media type must be taken into account when planning a media campaign.
3. Wherever possible, make use of professional services to plan and co-ordinate media campaigns.
4. Develop a good relationship with media organisations in your region by making a personal visit to news editors or journalists.





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9TH BIENNIAL WEEDS CONFERENCE

Closing Address

John Fisher
Program Leader, Weeds
NSW Agriculture

The theme of the conference was improving noxious weed control for the 21st century. With noxious weeds, the whole logic of the legislation is to provide a benefit for the community. We are not doing something to benefit NSW Agriculture, we are not doing something to benefit any particular person or organisation. The objective is to satisfy the communities' needs and their weed control priorities. The first question then becomes "If we are thinking about the 21st century, what are the likely changes in what the community is going to need or expect or want from us?"

The first change is increasing environmental concern. Environmental concerns can be positive for us or they can be negative. They can assist with weed control or they can hamper it. There is certainly an increasing acknowledgment in the community that weeds not only have a big effect on production but they are having an effect on the environment. We had a number of talks, for example, Richard Groves, Kate Blood, Judie Rawling, all touching on the environmental effects of weeds. There is acknowledgment that weeds can threaten species - National Parks and Wildlife are preparing a submission for bitou bush to be acknowledged as a threatening process under the Threatened Species Act. There is also an increasing involvement from community groups. People want to be involved with controlling weeds and restoring bushland. These interests are leading to an increase in the publicity. The general media are becoming aware of weeds, for example the article in the Bulletin of 15 August 1997, a 2 page article in what's normally a business type magazine referring to the war on weeds. If we are going to use the media effectively we have to make sure that they get accurate information.

There are also a number of negative effects, and we certainly touched on those today, Graham Matthews and Harvey Baker referred to the difficulties and the frustration that are being imposed on all of you because of the way certain sections of the community are responding to weed control programs. We certainly sympathise with people responsible for carrying out public weed control programs, but there is not a great lot that we can do directly. We have to think about how to address that problem. Harvey Baker gave some good advice in his talk. Try and develop alliances where you can with groups that can be beneficial. There is no point in becoming involved in head-on conflict with people. We have to somehow pick up the more moderate ones in those groups and bring them around to our point of view and that is what Rod Ensbey was elaborating on in his talk.

When you start thinking about those groups and why they are concerned and why they don't see the things the way we see it, there are a number of reasons. Harvey touched on one - that is the Vietnam War. A lot of opposition to chemical use is still tied up with the politics that hang over from Vietnam. There is also another problem in that the credibility of governments and business in relation the health effects on people is pretty poor. If you think back over the last 10 or 20 years the number of times that people from government or people from businesses have stood up there and said "DDT is not a problem", "smoking is not a problem", "Mad cow disease (in England) is not a problem". The general public say "This is crap, we

know its a problem, they are not being honest with us". Part of the reason we have lost some of these environmental groups is that governments and business haven't been really honest with them and that's something we have to try and redress.

Sometimes there are conflicts between controlling a weed and some other aspects of biodiversity. At Homebush Olympic site there is a quarry there that is full of pampas grass. Judie Rawling would love to go in and control but the green and yellow bellfrog is in there and she has been told that she cannot remove the pampas grass. There is going to be increasingly more of this type of conflicts that sometimes inhibit your ability to control weeds. You have to try and think your way around those problems to see if you can find some sort of compromise that allows you to at least minimise the weed problems and still acknowledge that community's other environmental concerns. Judie Rawling had a good little take home message in her talk "Work with it - don't tell us, show us and be there", and whilst she was referring specifically to working with community groups it is also a message that applies to that broader issue of how we bring people on side, how we make use of the environmental movement. The environmental movement, if we get them on side can be a very powerful ally. Weeds, as we all know, do have big environmental effects, and if we can harness the environmental movement rather than conflicting with them, then we can start to have an impact with politicians.

The second group of community demands is to do with demonstrated efficiency and effectiveness. People want to know that they are getting bang for their bucks, governments want to know that they are getting value for the money they invest in anything, whether its roads or killing weeds or whatever. So the consequence of that is that we are all coming under increasing pressure for planning and for monitoring and for demonstrating the outcomes we achieve. It doesn't matter where you are, whether its government, local government or private business, the same pressure is there. So planning and monitoring need to occur at the whole range of levels. It has to be done at national, state and regional levels.

In this conference we have not talked about the National Weeds Strategy, briefly, the National Weeds Strategy has three goals:-

- First, to prevent the development of new weed problems. The Commonwealth is responsible for maintaining the quarantine barrier around Australia.
- Second, to reduce the impact of existing weed problems of national significance. To achieve that aim there will be a list of weeds that are designated as being of national significance. A consultancy has been let to develop the process, that is, list of data required, and the outcome of that process will be a score that will be used to rank weeds. The top few of that list will be declared to be of Weeds of National Significance (WONS). Obviously there are lots and lots of weeds that are very important regionally. The Commonwealth are keen to have a relatively small list so there are going to be lots of important weeds that don't make the national list. This will give us a lot of controversy which will be great for publicity. The process for prioritising weeds will be delivered to the National Weeds Strategy Executive Committee in mid December 1997. The Commonwealth have provided \$24million over 5 years to assist with controlling those weeds of national significance. It sounds like a lot of money, but over the whole of Australia for 5 years it is not very much, but it will be useful for obtaining coordination between states and it could be useful for doing some biocontrol work and other research.

- The third goal of the National Weeds Strategy is to provide cost efficient and effective means for harnessing national action on weed management. That refers to research, education, training and making sure there is coordination between all the providers.

The NSW Weeds Strategy which was released shortly after the National Weeds Strategy, is linked closely with the national one. Because of this we did not produce another book, rather we just highlighted the main points, and listed the outcomes to be achieved.

- Prevention of new weed problems. Jim Dellow in his talk referred to one aspect of new weed problems, that is nurseries selling plants. Weeds moving in from interstate are another source of potential problems.
- We also have to be aware of broader environmental issues. Weeds are often symptoms of problems rather than the cause of problems. With many of our aquatic weeds, the underlying problem is nutrient levels in rivers and river flow. There is acknowledgment in the Strategy that we need to consider, environmental and community weeds, as well as production weeds.
- We acknowledge that before we can really put pressure on private landholders we have to get our act straight with public lands. At the moment there are big problems on some areas of public land and we are hoping we can use the NSW Weeds Strategy to encourage other departments to control weeds on public lands.
- Coordination and resource sharing - we are promoting the idea of regional planning, regional committees, county councils in some situations. There needs to be better coordination and sharing of resources.
- Legislation - the Noxious Weeds Act is up for review by next year. An issues paper has been prepared that covers the problems reported to us over the last few years and there will be opportunities for discussion in early 1998.

The community wants more effective weed control options from us. It has been said before, for every complex problem there is a solution that is simple, is obvious and does not work. We have to be very careful with weed control that we don't just grab a simple apparently obvious solution and so waste a lot of time and money. There are some new technologies coming that are going to be quite valuable to us. The herbicide resistant crops certainly open up a whole new range of opportunities but we must make sure that we don't squander those opportunities away. We have to learn from our past mistakes and to concentrate on integrated weed management. In Jim Morrison's talk he emphasised on competition with weeds and that is often a key element in integrated weed management. We also heard about biological control and the new work that is going on there.

Another subject we did not talk about during this conference was the Weeds CRC (The Cooperative Research Centre for Weed Management Systems). NSW Agriculture is a major partner in the CRC along with CSIRO Division of Entomology, University of Adelaide, KTRI Frankston, WA Dept and some others. The CRC is a way of coordinating our research efforts and there is additional money from the Commonwealth. We are quite confident there will be some good outcomes for you, in terms of better weed control methods over the next few years.

In conclusion, I would like to quote Todd Duffy "The significant problems that we face today cannot be controlled with the same level of thinking that created them". The aim of this conference is sharing information so that when we all go back home we can all do something better. I can go back home and have an awareness of the problems with our legislation and

the problems with how we interact with you. Hopefully you can go back home with some ideas to improve your weed control. But if we all go away from here and keep doing the same sort of things that have been done before, then this conference has been a waste of time. It might have been an enjoyable waste of time but unless you go away and do something different then we haven't achieved anything. Think about what you have heard over the last few days, in the talks, around the bar having a beer, and think about what you can actually adopt when you go home.



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CONGRATULATIONS KEVIN NELLIGAN !
1997 Winner of the DuPont - Macspred Travel Award

Geoff Keech
Sales Supervisor
Macspred Pty Ltd

Kevin Nelligan, Noxious Weeds Manager at Cowra Shire Council has won this year's DuPont - Macspred Travel and Education Award. Congratulations from the sponsors and all delegates to the Dubbo conference.

Kevin's entry was selected as the winner because he spent a little time reading and answering the questions raised in the competition guidelines (see below).

Entrants should submit a written proposal outlining the activity they wish to undertake using the following guidelines.

1. The nature of the activity (travel, education etc.)
2. The relationship of the activity to noxious weed control / management.
3. How the activity will benefit the recipient and improve their knowledge and understanding of noxious weed management.
4. How the activity will benefit the employer and the community.
5. An overview of the three main noxious weed problems in their area.
6. An overview of the local community (agricultural production, industrial developments, climate, population and catchment relationships).

These guidelines were sent out to give the entrants a clue as to what the judges would be looking for, and Kevin answered each point in a clear and easy to read manner. It was important to write the submission in your own words, as should the award have been given for travel to Interstate or New Zealand to visit your counterparts there, some indication of the knowledge of your own district and ability to impart that knowledge would have played a major part in the scoring.

Kevin's entry is printed on the following pages and should be looked upon as an indication of the minimum requirement for the next competition.

Once again Kevin, congratulations. We look forward to hearing of your progress and your report to the next conference.



DUPONT/MACSPRED TRAVEL AND EDUCATION AWARD

**Kevin Nelligan
Noxious Weeds Manager
Cowra Shire Council**

The purpose of this entry is to endeavour to gain further education and training regarding the biological control of St. Johns Wort.

The Keith Turnbull Research Institute in Victoria is currently in charge of the raising, releasing and monitoring of the mite (*Acutus hyperici*) for control of St. Johns Wort.

I would like further training by spending some time with Mr. Franz Mahr at the Institute.

Training is required in this field to enable officers to identify the agents used in this programme. Collection and distribution can then be carried out over a wide area hastening the establishment process. This will complement the programmes already in place, i.e. chemical control and pasture improvement. This combination of control methods must surely be the essence of integrated pest management.

The skills and knowledge required can be passed on to community and landcare groups thus enhancing the programme. Ag students can also be involved in the establishment of their own nursery sites. This can then be a "hands on" study for years 11 and 12 doing the Higher School Certificate.

This activity will be of great benefit to Council and the community at large by:

Reducing the use of chemicals as Cowra is fast becoming renowned for its production of excellent wines, as we all know how susceptible vines are to herbicides;
Cleaner water and environment as most of the St. Johns Wort is located in the catchment of Wyangala Dam.

Higher productivity in the wool industry and a better fibre quality. If Wort does not kill sheep that are exposed to it, they certainly will develop a break in the staple.
Weeds staff will be able to carry out more time on other weeds rather than half their time on one weed.

5. & 6. The following is an overview of three noxious plants affecting Cowra Shire and demonstrates the problems experienced by Weeds Officers in carrying out their duties and is designed to enlighten the reader and to create an awareness of the problems involved, accordingly I submit this entry to you and wish you pleasant reading.

PAPER FOR THE DUPONT/MACSPRED TRAVEL AWARD FOR THE
9TH BIENNIAL NOXIOUS WEEDS CONFERENCE

CONTENT

The three major noxious plants adversely affecting Cowra Shire.

First and foremost, I believe that a brief description of what is required of an officer to carry out noxious plant control and a description of the Shire and its situation is necessary to allow the reader to fully comprehend the problems and solutions borne out of noxious plants and their control.

Staff

Dare I say that when an officer takes on the job of containing the spread of noxious plants he is either insane, knows not what is in store for him or knows very little about the way noxious plants spread. Don't believe me? – then I'll put it this way, who in their right mind would take on the control of a plant that grows in cover, can only be seen when it flowers, sets 33,000 seeds, runs laterally forming suckers, is easily transported by livestock, cars, boats, trailers and shoes whilst infesting catchment areas and almost every National Park in the State?

If you were to put this scenario to an Army General, he would undoubtedly say "you cannot win" even if he had a thousand troops, however, we know this is not the case and that control of such a situation is left in the hands of one or two people.

The Shire

The Cowra Shire is situated partly in the catchment area of Wyangala Dam and along the floodplains of the Lachlan River. The Lachlan forms a division throughout the middle of the Shire, whilst the Belubula River, a tributary of the Lachlan, forms a boundary with Cabonne Shire to the North.

The Lachlan River produces a major flood at intervals of 20 years and moderate and minor floods every 3 to 4 years. The Belubula River because of steep catchment is considered one of the fastest flowing rivers in the State and suffers from major flooding many times each year. Also the layout of the land along the Belubula causes most of the flooding and silt deposits to occur on the Cowra side hence a very fertile flood plain and of course a resultant weed problem.

We are responsible for control on both sides of the floodplain of the Lachlan below Wyangala until the river exits the Shire below Gooloogong where it enters the Forbes Shire.

The Shire is known as a safe district with wide stock routes, luscious feed and ample water on river reserves. Heavy concentrations of travelling stock occurs along these routes in droughts when dealers from many part of the State come to take advantage of the feed and water and to leave a noxious plants nightmare in their wake. This has now occurred twice in the last decade, once in 1983 and again in 1991. Both times Council has been left with a problem of gigantic proportions and a massive bill for the clean up programme. Sometimes and in some situations this clean-up takes many years and is usually achieved just in time for the next

drought and resultant invasion. Therefore, it should not be hard to understand how this demoralises the staff involved.

St. Johns Wort

This plant is an ongoing problem in the Shire. It was spread along roads in the Shire by travelling stock in 1982 and was particularly bad in 1984/5. Since then each year a programme of control has been instigated followed by a debriefing among staff on how to deal with the pest the following year. The outcome of these debriefings usually results in a keenly motivated staff with all the answers on how we will lick the situation next year. However, armed with all modern chemicals, the best equipment (a left hand drive power steered automatic truck with all the latest in pumping and reeling equipment), the best advice and recommendations from the Department of Agriculture and chemical companies, only to find half way through the programme that factors unpredicted and beyond the control of staff come into play resulting in the weed managing to produce enough seed to undo the work already carried out.

These unknown and uncontrollable factors strongly emerged in 1992. Factors like heavy rainfall commencing with 10 inches in February and concluding with 3.5 inches. Christmas Eve brought the annual rainfall for 1992 to 40 inches. This brought about infestations beyond imagination. Other factors like seed dormancy, heavy use of travelling stock routes by drovers during 1991 and the particular route taken by them were factors hard to plan for, least of all control, and if that was not problem enough, how about this, the 1990 wet caused a break up of many roads in the Shire, the unsuitable gravel under them was scraped up and dumped on the roadside verge many 1,000 metres along and 6 inches deep, well do you want to know, you guessed it, St. Johns Wort seedlings emerged in the millions.

These areas are boom sprayed as hand spraying was impossible. Our theory is that these seeds must have lain dormant under the asphalt for 30 to 40 years and where they came from is anyone's guess. Not convinced yet, well what about adding insult to injury with this situation.

The Engineer's staff in their ignorance and wisdom had opened a quarry in the northern area whilst we were in the southern areas and carted A grade gravel in a 15 mile radius. Yes, this quarry is situated in one of the most heavily infested areas and has been closed for 30 years. Now root segments and seed have been deposited on roads that have been kept and were considered free.

Now, a new strategy is on the drawing board. The aim is to treat all St. Johns Wort by second week of flowering. The Shire has been cut into four quarters with an operator/inspector in each quarter, we are optimistic that each operator will do his area by the second week of flowering, leaving time to enter private property as contract or under Section 20 entry if necessary. We are firmly of the belief that the only way to handle St. Johns Wort is to aim for 100% control.

The Wyangala State Recreation Area is a matter of real concern to us and to other adjoining Shires. We feel that the Trust is not doing enough to control St. Johns Wort and therefore does not display enough initiative to attract a grant from the Noxious Plants Advisory Committee. Therefore, we intend to take much firmer action with regard to this area.

Johnson Grass

This was a weed of significant importance in 1980 when it was declared noxious in Cowra Shire. It had already overrun many productive properties on the Belubula River and was imposing a similar threat to the Lachlan downstream of Cowra.

A special Committee was formed in 1980 to formulate a uniform policy for control and to ensure this policy was carried out by all constituent members of the Committee.

Cowra and Cabonne Councils who were the worst affect by this weed, took the matter further by introducing a joint inspection programme. This meant that both sides of the river were inspected by both inspectors with individual property reports made out. This type of approach has been very successful in reducing, in area and density, a weed problem common to both Shires.

The Cowra Shire was also successful in gaining a revolving fund grant in 1984, to assist landholders with their control programmes. This was of great benefit to landholders, particularly the smaller ones who had diversified into row cropping of vegetables.

It is a readily known fact that row cropping is the quickest and easiest way to proliferate Johnson Grass. The gaining of a revolving fund grant meant that landholders could treat their entire property in one year rather than a piece meal approach over 5 years or longer.

Johnson Grass levels are now on a decrease on the Lachlan and Belubula River flats and now pose no threat to the Shire.

Boxthorn

This weed was particularly bad on crown land reserves, shire roads and other vacant and abandoned blocks in and around the town and local villages.

I was fortunate when I commenced work with Cowra Shire in that my predecessor had manufactured two special tools for the extraction and dismembering of this particular plant.

The directions went something like this:-

First approach the bush and size it up for the particular type of instrument chosen.

Then you were to either crawl in under the boxthorn and saw it off with the bow saw whilst endeavouring to avoid having the bush fall on you or if this method appeared dangerous, you were instructed to stay clear of the bush and by taking the long saw (a short saw with a 10 foot handle) saw off the bush at ground level.

If this treatment for any reason was not effective then you were to take the guillotine and crawl in placing the jaws around the trunk and jacking the jaws closed and in doing so, cut the bush off at the stump. Then treatment of the stump with equal parts of 245-T, distillate and sump oil was to be carried out.

Then if you survived the summer without being bitten by a snake or blood poisoning from the thorns you could visit each bush in the winter and burn them with fire.

This campaign, however heavy on manpower, was low on chemical consumption and was very effective. When I joined the team we only had suckers and seedlings to contend with and which we treat annually with glyphosate.

This is a true and authentic description of a weedo's memoirs in Cowra and I have kept these tools as a source of discipline for any new members that are prone to misbehave, as a few weeks on the long saw or guillotine usually achieves a compliant and grateful employee.

Now we come to 1997 and where does that leave us, a new Weeds Act, categories, Award Restructuring, Performance Agreement, Weed Strategies, Regional Weed Programmes, mission statements, visions and goals – all the high tech terminology that you can possibly dream of, however, the weeds remain defiant irrespective of the ploy designed to bring about their demise, perhaps it can be said that when all is said and done, most likely they are laughing at us.



VALOUR AWARDS

Valor Awards were presented to a number of Weeds Officers and associated personnel who were considered most worthy of the award.

- 1) Road Runner's Award - Peter Proctor
*Kept fit running stachels upstairs and downstairs.
Hugh Milvain was a strong stayer, but Peter ran in better on weight and age.*
- 2) Happy Napper Award - Pat Walmsley
*Nothing aroused him.
Many contenders from Day One!*
- 3) Investor's Award - David Karlson
*Shirley Horsfield had more success with her investments.
Thanks from the "Club" for your support!*
- 4) Rolf Harris Award - Mike Boulton
*Rolf had Mike in mind when he composed "Jake-the-Peg"
Note: Mike was on crtuches following surgery.*
- 5) Opticum Award - Ken Hayes
*For Communication! and Communication and **MORE** Communication*
- 6) Best Actor Award - Roger Smith
*Promoting Weeds Awareness Week as "Woody"
Cut quite a figure in tights! Not sure whether he does parties?*
- 7) Lateral Thinker Award - Graham Matthews
No other contenders! No explanation required!
- 8) State of Origin Award - Scott Dearden
*NSW has won the Parthenium Battle
Scott has worked effectively on his game-plan but still needs a winner!*
- 9) Linguist Award - Dick Honeyman
*Serves up a good Verse and Speaks his mind on occasions!
A poem prepared and presented at the Biennial Dinner to capture the activities of the
Conference and its participants.
Always good value - Congratulations again DICK!*
- 10) Plant identification
*The standard was high with most winners achieving 100% correct.
Ken Hayes (Coffs Harbour), Terry Schmitzer (Hastings)
Geoff Keech (Macspred Tamworth)
David Pomery, Tony Martin (Illawarra)
John Conlan (Lockhart), James Smith (Coolamon)*
- 11) Most outstanding written paper from an officer - Lee Amidy, Jim Morrison
These papers, on aerial inspections and Consul lovegrass, are worth another look.



PHOTO GALLERY



The evil arms of Woody the Weed reach out with unprecedented impact.



Woody the Weed engulfs conference convenor, Peter Gray.



Graham Matthews, Bellingen Shire, receives the lateral thinkers award.



Kevin Nelligan, Cowra Shire, receives the DuPont Macspred Travel Award from Bernie Horsefield (Macspred) and Matt Jones (DuPont).

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Mr John Perkins Noxious Weeds Inspector Far North Coast County Council PO Box 238 Casino NSW 2470 Ph 02 6662 2396 Fx 02 6662 5511	Mr Ken Pines Pest Management Officer National Parks & Wildlife Service PO Box 402 Armidale NSW 2350 Ph 02 6773 7211 Fx 02 6771 1894	Mr Jim Quinn Supervisor NSW Agriculture PO Box 581 Gosford NSW 2250 Ph 02 4348 1900 Fx 02 43481910
Ms Marina Peterson Environmental Officer Department of Defence Liverpool Military Area Liverpool NSW 2174 Ph 02 9600 4653 Fx 02 9600 4648	Mr Darren Pitt Pest Control Officer National Parks & Wildlife Service PO Box 72 Narrabri NSW 2390 Ph 02 6799 1749 Fx 02 6792 1133	Ms Judie Rawling N W A C Urban Bushland Management Ltd 4/31 Terminus Street Castle Hill NSW 2154 Ph 02 9894 2255 Fx 02 9894 2215
Mr Jim Peterson Councillor Tenterfield Shire Council PO Box 214 Tenterfield NSW 2372 Ph 02 6736 1744 Fx 02 6736 1669	Mr David Pomery C W O Kiama Municipal Council PO Box 75 Kiama NSW 2533 Ph 02 4232 0222 Fx 02 4232 0255	Mr Peter Reed Ranger National Parks & Wildlife Service PO Box 707 Nowra NSW 2541 Ph 02 4423 2170 Fx 02 4423 3122
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